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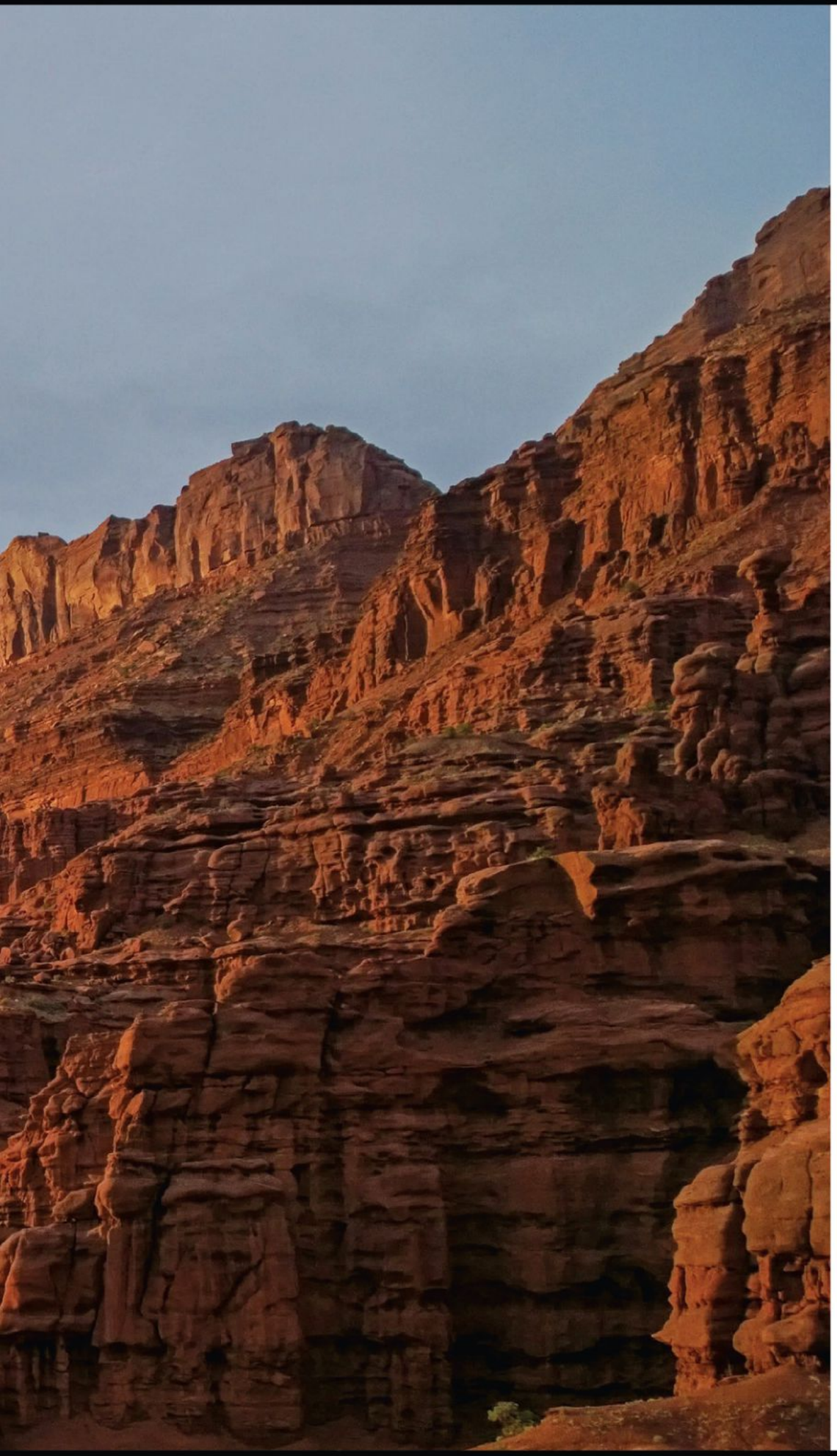
125TH ANNIVERSARY **COLLECTOR'S EDITION**

THE PHOTO ISSUE





8:45 p.m., July 5, 2013
Fisher Towers, Utah
Shot with the Nokia Lumia 1020



NOKIA

Ten days. Vast landscapes. Ever changing conditions. Endless details. A National Geographic photographer captures the iconic American West—armed only with a smartphone.

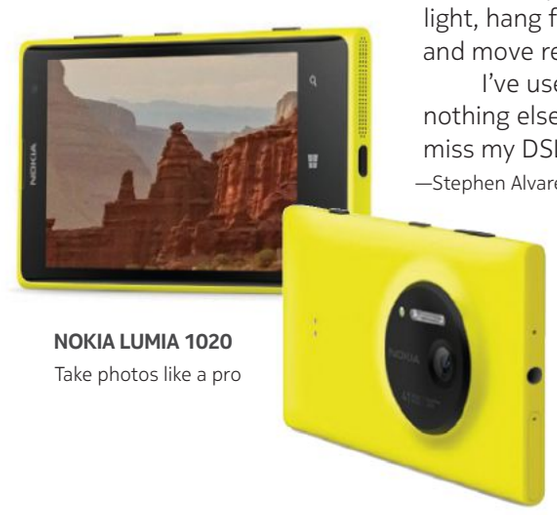
“Nothing else compares.”

“I look at the images from this assignment and can’t believe I shot them with a smartphone. My Nokia Lumia 1020 performed like a professional DSLR camera under every condition—from low light to moving airplanes. The 41-megapixel sensor holds so much detail, the resolution is stunning, even when I reframe or zoom in.

Since I had manual control over ISO and shutter speed, I could take pictures I never would have attempted before with a phone. I also wasn’t constrained by the physical bulk of a regular camera, so I could scramble up rock towers to catch the best light, hang from ropes to get new angles, and move really fast.

I’ve used a lot of camera phones, and nothing else compares. Never once did I miss my DSLR.”

—Stephen Alvarez, National Geographic photographer



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NATIONAL GEOGRAPHIC

VOL. 224 • NO. 4 OCTOBER 2013



This portrait of an Ojibwa woman, taken in Minnesota in 1907, captures a lost way of life—and the nostalgia felt by those who never witnessed it.

ROLAND W. REED, NATIONAL GEOGRAPHIC CREATIVE

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National Geographic is available on the iPad, the Kindle Fire, and the iPhone.



Show and Tell
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Hear our photographers in their own words.



Glacier Retreat
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Watch a time-lapse meltdown in Alaska.

On the Cover This iconic close-up of Sharbat Gula, taken when the Afghan orphan lived in a Pakistan refugee camp, appeared on the June 1985 cover. Other images reveal the range of our photographic coverage. *"Afghan Girl" photo by Steve McCurry. For information on other photos, go to* ngm.com/photoissue.

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PHOTO (GLACIER): JAMES BALOG, EXTREME ICE SURVEY WITH MATTHEW KENNEDY

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Picture This

Readers of *National Geographic*'s first issue can be forgiven for not being thoroughly captivated. The magazine that debuted in 1888 was a drab scientific publication of 98 pages wrapped in a plain brown cover. Several meteorological maps broke up the drone of black-and-white print. Articles included "The Classification of Geographic Forms by Genesis" and "The Survey of the Coast."

And that's how it pretty much remained for 16 years, until 1904, when the magazine's printer told Editor Gilbert H. Grosvenor that he had 11 pages to fill. Grosvenor grabbed a package from the Imperial Russian Geographical Society containing some of the first photographs of Lhasa, Tibet, which was then considered one of the world's most exotic places. He selected 11 and sent them to the printer, certain he would be fired and ridiculed. When the issue came out in January 1905, the opposite happened. People stopped Grosvenor on the street to congratulate him. So it was that photography, the hallmark of *National Geographic* and the most immediate means of communicating with our readers, came to the magazine. It was born out of desperation—and risk.

It is 125 years later, and we still take risks. Risk is part of creativity. That and our photographers' passion and commitment are as much a part of their gear as the camera.



This image of women in Lhasa was among the first photos ever published in the *Geographic.*

 PHOTO: RUSSIAN GEOGRAPHICAL SOCIETY/NATIONAL GEOGRAPHIC CREATIVE

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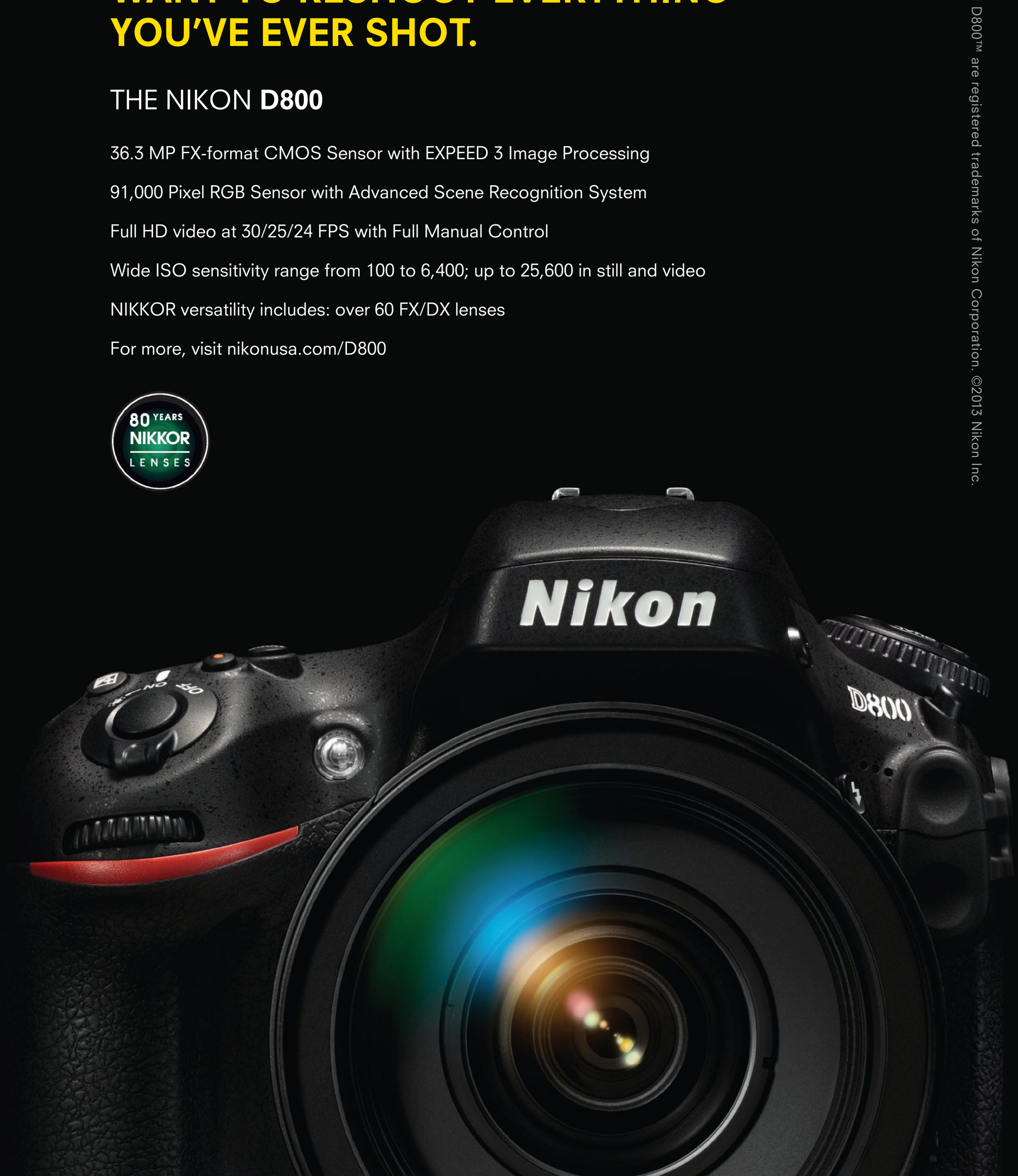
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REMEMBRANCE

Robert Gilka (1916-2013)



Bob Gilka—legendary *National Geographic* director of photography—was married for 63 years to Jan, who died in 2004.

Emperor of the Image

He didn't speak, he growled in a low-level rumble like the sound of distant thunder or the scrape of boots over gravel. For many, his was the voice of God, a stature reinforced by the needlepoint panel that hung above his office door. "Wipe your knees before entering," it said.

Despite the kneeling bench beside his desk (a photographer's not entirely facetious gift), Robert Emanuel Gilka, who died on June 25 at the age of 96, was anything but lordly. He was modest, with a single-minded focus on the craft of photojournalism. Over the course of a 27-year career at *National Geographic*—22 of them as director of photography—he set the standard for the magazine's visual excellence.

He was adored and feared by his photographers. The fear was of disappointing the man they worshipped, of not meeting the high standard he set. Underwater photographer David Doubilet was once asked which was more frightening, a great white shark or Bob Gilka? Doubilet unhesitatingly replied, "Gilka—if you didn't deliver the goods."

Gilka started at *National Geographic* on September 18, 1958, when the magazine still followed the "red shirt" school of photography—sending someone to the field with a red shirt to add a spot of color to the frame. "We got over that in a hurry," Gilka said.

He pinpointed talent like a heat-seeking missile, assembling a team that would bring the excitement, immediacy, and candor of photojournalism to the pages of the magazine. He was the St. Peter of portfolio assessment—an anxiety-filled hell for the photographer-supplicant. He'd go through a collection of images silently. "Do you intend to make your living doing this?" was a common soul sinker. He was blunt. It was the truth and nothing but. "I sometimes think the portfolio was the least of it," adds one of his hires, Cary Wolinsky. "Gilka wasn't looking for photographers. He was looking for storytellers." *—Cathy Newman*

"To rise above the great pack of people calling themselves photographers, one must develop seeing senses to the utmost."

—Robert Gilka

PHOTO: BILL MARR AND SARAH LEEN, NGM STAFF

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RUINS, MONUMENTS, AND ARCHITECTURAL WONDERS

Photographing ancient Maya pyramids in Mexico's Yucatan Peninsula? Get to the site at dawn, which means staying overnight at a hotel close by. You'll have the advantages of fewer visitors and exquisite light. Every seasoned photographer will tell you that no matter how sophisticated the gear becomes, it is still all about light and composition. Avoid midday light; it creates all sorts of picture-compromising shadows. From landscapes to people, street scenes to wildlife, shoot when the light is coming from the side—early morning and late in the day.

MOVING WATERS

Do you want crisply delineated or softly blurred? Ocean waves, waterfalls large and small, and even fountains offer the chance to experiment with length of exposure and the resulting images. Because you likely are shooting during the day, with natural light, you can choose a fast shutter speed to capture the wave as it curls, the frothy water as it falls. For something softer and dreamier, opt for a longer exposure and set your camera on a tripod or any flat surface.

APPETIZING PRESENTATIONS

Your best bet for photographing a food still life is to make late-lunch restaurant reservations, requesting a table next to a window. Take a straightforward shot of the plate from above. To play with the image, shoot from the side, and have the food in focus, with the background gently out of focus. And think "composition": Try having the dish somewhere other than the center of the frame, with the edge of a glass or maybe the silverware peeking into the edge of the composition.

AUTHENTIC SMILES

Hoping to take good pictures of the locals? Laughter and lighthearted conversation or, if language is a barrier, eye contact and smiles, will help your subjects relax and offer up truer aspects of themselves. It's up to you to set the stage by being friendly and at ease. Profile and even three-quarter views add a welcome immediacy; try to have your subjects gaze away from your lens.

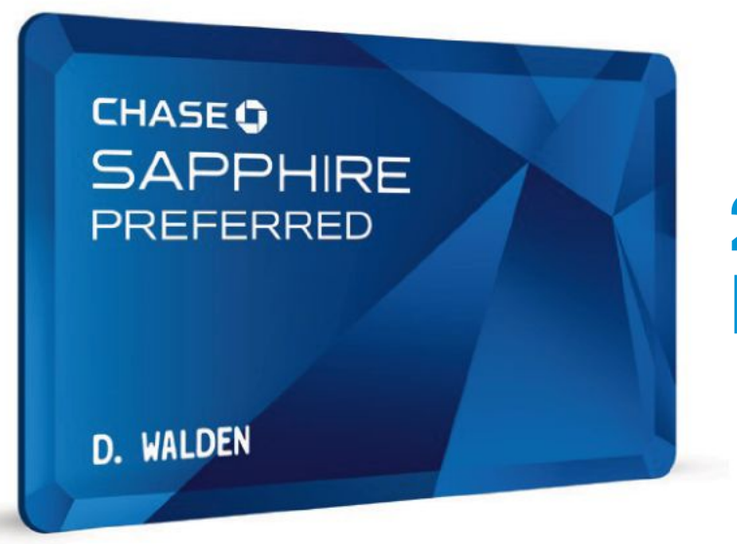
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How to Fix Everest

"The mountain is so high and so indifferent it calls upon every climber, at one time or another, to rise to his or her better self," reads your article. I might believe Everest climbers had a better self if, with their iron wills and monetary advantages, they also figured out how to remove their detritus and the bodies of their fallen comrades. Where is there a better self in evidence when people reach a self-interested goal but take no care of the environment they are traversing?

JOANNE PAYLING
Livermore, California

Only three people have reached the deepest ocean depths, and twelve the moon, yet thousands have reached Everest's summit. This really illustrates that the oceans are Earth's greatest unexplored space.

MAGGIE MATHWIG
Virginia Beach, Virginia

I often fantasized about climbing Mount Everest and reaching the highest point on Earth. After reading your article, I will take that dream off my bucket list. A two-hour wait at the Hillary Step, 234 people reaching the summit on a single day, bodies along the route, "garbage leaking out of the glaciers and pyramids of human excrement." Everest now holds the same draw for me as standing amid the crowds in Times Square on New Year's Eve—none.

ADAM B. LEMPEL
Chesterfield, New Hampshire

Nothing could better illustrate the callous disregard for the mountain and other people than a body left alone in the snow while others step over and around in their selfish zeal to reach the summit and gain their associated bragging rights.

JOHN MUMMERT
Arlington, Texas

Viking Whalers

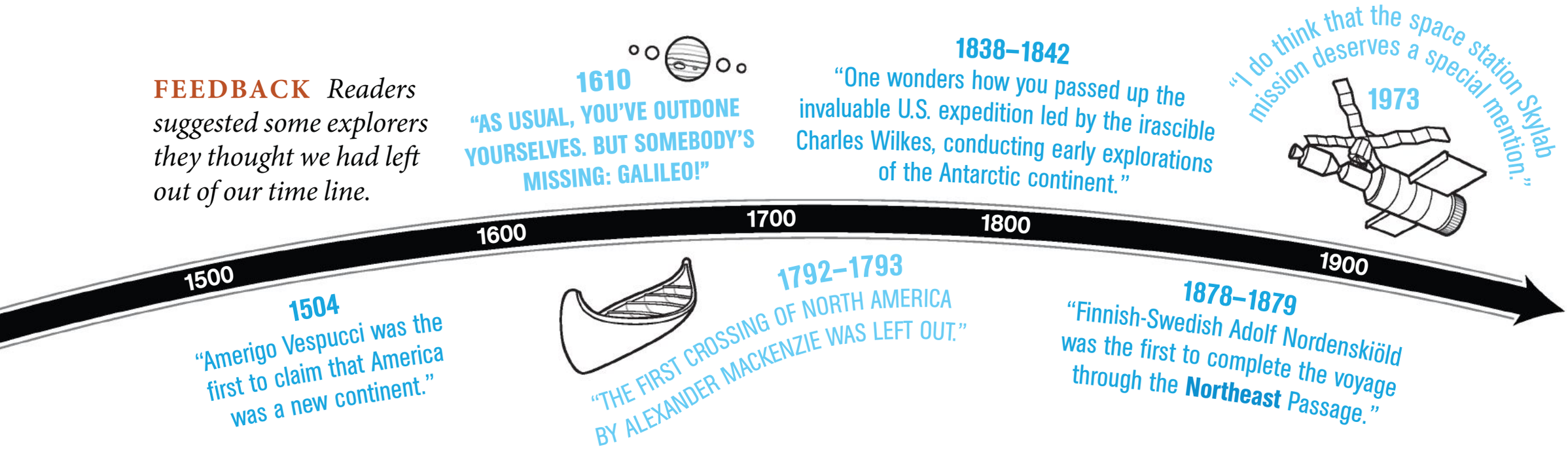
Your article on the last of the Viking whalers left me with mixed feelings. Should they comply with the moratorium on whaling? Probably yes. Should they let the beautiful minke whales live? Again yes. Yet one cannot help but admire their commitment to the old way and the struggle to keep it alive.

SUSAN PETERSON
Bloomington, Minnesota

Interesting that articles about Japanese whalers—540 kills in 2011—often present them as unprincipled brutes. While in this article Norwegian whalers, who kill for commercial purposes—533 kills in 2011, only 1.3 percent fewer—are the noble remnants of a dying culture.

KAREN PHELPS
Corvallis, Oregon

FEEDBACK *Readers suggested some explorers they thought we had left out of our time line.*



EMAIL ngsforum@ngm.com **TWITTER** @NatGeoMag **WRITE** National Geographic Magazine, PO Box 98199, Washington, DC 20090-8199. Include name, address, and daytime telephone. Letters may be edited for clarity and length.

GRAPHIC: MATTHEW TWOMBLY, NGM STAFF



Humalog KwikPen is prefilled with mealtime insulin, so it goes just about anywhere you go.

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Who should use Humalog?

Humalog is used to treat people with diabetes for the control of high blood sugar.

IMPORTANT SAFETY INFORMATION FOR HUMALOG

What is the most important information I should know about Humalog?

- Do not change the insulin you use without talking to your healthcare provider. Doses of oral antidiabetic medicines may also need to change if your insulin is changed.
- Test your blood sugar levels as your healthcare provider instructs.
- When used in a pump, do not mix Humalog with any other insulin or liquid.

Who should not take Humalog?

- Do not take Humalog if your blood sugar is too low (hypoglycemia) or if you are allergic to insulin lispro or any of the ingredients in Humalog.

Before using Humalog, what should I tell my healthcare providers?

Tell your healthcare providers:

- About all of your medical conditions, including liver, kidney, or heart problems.
- If you are pregnant or breastfeeding.
- About all the medicines you take, including prescription (especially ones commonly called TZDs [thiazolidinediones]) and non-prescription medicines, vitamins, and herbal supplements.

How should I use Humalog?

- Humalog is a rapid-acting insulin. Take Humalog within fifteen minutes before eating or right after eating a meal.
- Always make sure you receive the correct type of Humalog from the pharmacy.
- Do not use Humalog if it is cloudy, colored, or has solid particles or clumps in it.
- Do not mix Humalog with insulin other than NPH when using a syringe. Do not mix or dilute Humalog when used in a pump.
- Inject Humalog under your skin (subcutaneously). Never inject into a vein or muscle. Change (rotate) your injection site with each dose. Make sure you inject the correct insulin and dose.
- Depending on the type of diabetes you have, you may need to take Humalog with a longer-acting insulin or with oral antidiabetic medicines.
- If you forget to take your dose of Humalog, your blood sugar may go too high (hyperglycemia), which can lead to serious problems like loss of consciousness (passing out), coma, or even death.
- Your insulin dose may need to change because of illness, stress, other medicines you take, change in diet, or change in physical activity or exercise.

What are the possible side effects of Humalog?

- Low blood sugar is the most common side effect. There are many causes of low blood sugar, including taking too much Humalog. It is important to treat it quickly. You can treat mild to moderate low blood sugar by drinking or eating a quick source of sugar right away. If severe, low blood sugar can cause unconsciousness (passing out), seizures, and death. Symptoms may be different for each person. Be sure to talk to your healthcare provider about low blood sugar symptoms and treatment.
- Severe life-threatening allergic reactions (whole-body reactions) can happen. Get medical help right away if you develop a rash over your whole body, have trouble breathing, have a fast heartbeat, or are sweating.
- Reactions at the injection site (local allergic reaction) such as redness, swelling, and itching can happen. If you keep having skin reactions or they are serious, talk to your healthcare provider. Do not inject insulin into a skin area that is red, swollen, or itchy.
- Skin may thicken or pit at the injection site (lipodystrophy). Do not inject insulin into skin with these types of changes.
- Other side effects include low potassium in your blood (hypokalemia), and weight gain.
- Serious side effects can include:
 - swelling of your hands and feet
 - heart failure when taking certain pills called thiazolidinediones or “TZDs” with Humalog. This may occur in some people even if they have not had heart problems before. Tell your healthcare provider if you have shortness of breath, swelling of your ankles or feet, or sudden weight gain, which may be symptoms of heart failure. Your healthcare provider may need to adjust or stop your treatment with TZDs or Humalog.
- These are not all of the possible side effects. Ask your healthcare providers for more information or for medical advice about side effects.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

How should I store Humalog?

- Unopened Humalog should be stored in a refrigerator and can be used until the expiration date on the carton or label.
- Humalog should be stored away from light and heat. Do not use insulin if it has been frozen.
- Opened vials should be kept at room temperature or in a refrigerator. Opened cartridges or prefilled pens should be kept at room temperature.
- Once opened, Humalog vials, prefilled pens, and cartridges should be thrown away after 28 days.

Humalog is available by prescription only.

For additional information, talk to your healthcare providers and please see Information for Patients on following pages. Please see Instructions for Use that accompany your pen.

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Information for Patients about Humalog®
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Read the "Patient Information" that comes with Humalog (HU-ma-log) before you start using it and each time you get a refill. There may be new information. This leaflet does not take the place of talking with your healthcare provider about your diabetes or treatment. If you have questions about Humalog or diabetes, talk with your healthcare provider.

What is Humalog?

Humalog is an injectable, rapid-acting, man-made insulin. It is used to treat people with diabetes for the control of high blood sugar. You should take Humalog within fifteen minutes before eating or right after eating a meal.

What is the most important information I should know about Humalog?

- Do not change the insulin you use without talking to your healthcare provider. Doses of oral diabetes medicines may also need to change if your insulin is changed.
- You must test your blood sugar levels as your healthcare provider instructs.
- If you forget to take your dose of Humalog, your blood sugar may go too high (hyperglycemia). If high blood sugar is not treated it can lead to serious problems like loss of consciousness (passing out), coma, or even death.
- Always make sure you receive the correct type of Humalog from the pharmacy. Do not use Humalog if it is cloudy, colored, or has solid particles or clumps in it.
- Do not mix Humalog with insulin other than NPH when using a syringe.
- Inject Humalog under your skin (subcutaneously). Never inject into a vein or muscle. Change (rotate) your injection site with each dose. Make sure you inject the correct insulin and dose.
- When used in a pump, do not mix Humalog with any other insulin or liquid. The infusion set should be changed at least every 3 days. The Humalog in the pump reservoir should be changed at least every 7 days even if you have not used all of the Humalog.
- Taking other medicines known as TZDs (thiazolidinediones) with Humalog may cause heart failure. Tell your healthcare provider if you have any new or worse symptoms of heart failure, such as shortness of breath, swelling of your ankles or feet, or sudden weight gain.

Who should NOT take Humalog?

Do not take Humalog:

- if your blood sugar is too low (hypoglycemia).
- before checking with your healthcare provider regarding any allergies you may have to its ingredients.

What are the possible side effects of Humalog?

- Low blood sugar (hypoglycemia). There are many causes of low blood sugar, including taking too much Humalog. It is important to treat it quickly. You can treat mild to moderate low blood sugar by drinking or eating a quick source of sugar right away. Low blood sugar may affect your ability to drive or operate machinery. Severe low blood sugar can cause unconsciousness (passing out), seizures, and death. Symptoms may be different for each person. Be sure to talk to your healthcare provider about low blood sugar symptoms and treatment.
- Severe life-threatening allergic reactions. Get medical help right away if you develop a rash over your whole body, have trouble breathing, have a fast heartbeat, or are sweating.
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You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

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- About all the medicines you take, including prescription (especially ones commonly called TZDs [thiazolidinediones]) and non-prescription medicines, vitamins, and herbal supplements.
- If you are pregnant or breastfeeding.

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- Humalog should be stored away from heat and light. Do not use insulin if it has been frozen.
- Opened vials should be kept at room temperature or in a refrigerator. Opened cartridges or prefilled pens should be kept at room temperature.
- Once opened, Humalog vials, prefilled pens, and cartridges should be thrown away after 28 days.

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Additional information can be found at www.Humalog.com

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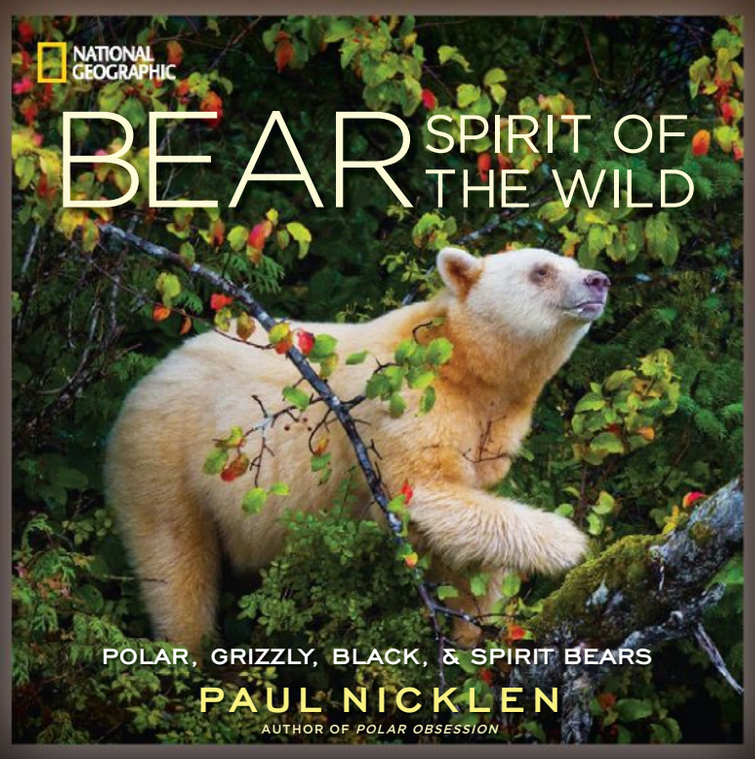
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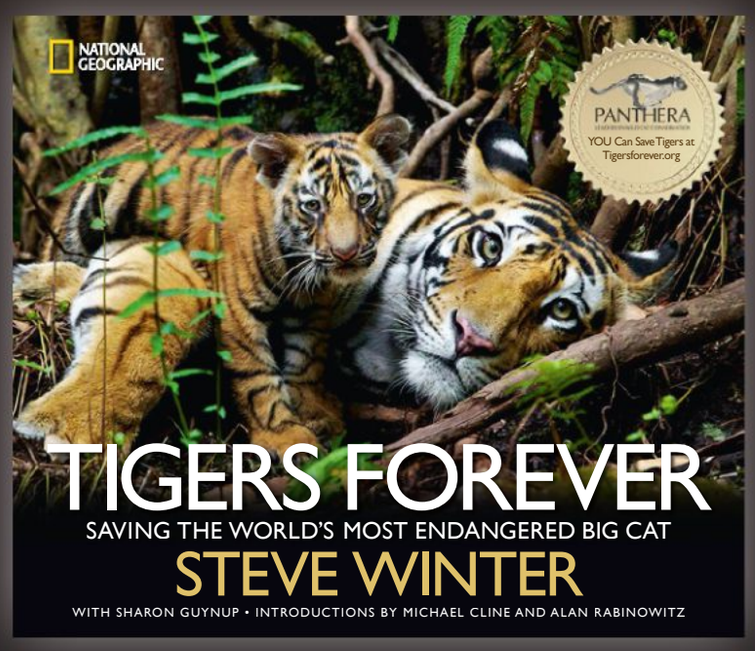
Award-winning National Geographic wildlife photographers Paul Nicklen and Steve Winter present stunning, up-close looks at the great and noble denizens of the wilderness in their native lands.



Nicklen's landmark photographs of these majestic mammals, paired with poignant essays from noted conservationists, deliver a powerful visual journal. Together, the stories and pictures are an eloquent call for protecting the bear and preserving its fragile habitat.



The tiger's plight is desperate. As a determined advocate for the iconic animal, Winter presents his riveting photographs and gripping stories, amplified with the passionate voices of those who have dedicated their lives to saving the deeply endangered, magnificent big cats from extinction.



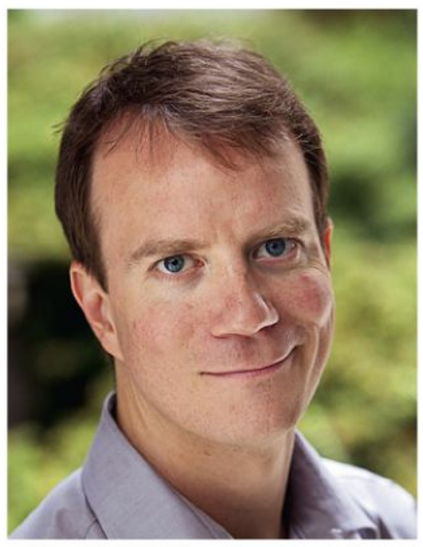
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Corey Jaskolski
National Geographic Fellow

EXPERTISE
Engineer

LOCATION
Mexico

Photo Finish

In 2011 we were in Mexico shooting a 360-degree composite photo in the Hoyo Negro cenote, a deep sinkhole that has filled with groundwater. There were human remains inside—more than 9,000 years old, among the oldest in the Americas. It was a forbidding dive; the government had put up a sign outside the caves that said, If you go past this point, you will likely die.

We had tested our camera system in a scuba pool, but that was ten feet of water. Now we were diving up to 200 feet deep. It was dark down there, so we took a SunSphere, a beach ball–size glass sphere full of batteries and LEDs. The plan was to tether the SunSphere and let it float above to light the whole cave.

When we turned the thing on, it was like we'd cut the roof off and seen the sun. We hid behind stalactites and stalagmites to keep from being blinded. The sphere would get too hot to stay on for long periods of time, so we arranged for the camera to turn the sphere on, take a picture, turn it off, then start again. It was a dance they were supposed to do. But we were having trouble getting them to do it.

We did four dives, adjusting the camera on dry ground each time. The jungle is a horrible place to take a machine apart. It's intensely humid, and one bug—they were everywhere—inside could have wrecked the camera.

We were running out of time and out of spare electronics. If we didn't get the picture, it would be like we were never there. The synchronized system ended up working only one time. It took 12 and a half minutes to get the whole thing: what we believe is the highest resolution underwater image in the world.



ART: ISTVAN BANYAI. PHOTO: MARK THIESSEN, NGM STAFF

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The 2013 RAV4 with available turn-by-turn navigation[1] and a complimentary 90-day trial subscription to SiriusXM.[2]

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Prototype shown with options. Simulated screen shown. [1]Availability and accuracy of the information provided by the navigation system or any XM services mentioned (if installed) are dependent upon many factors. Use common sense when relying on information provided. Services not available in every city or roadway. Periodic Entune® app updates do not include navigation updates. Navigation updates are available at an additional cost from your local Toyota dealer. See your *Navigation System Owner's Manual* or contact XM for details. [2]XM services require a subscription after trial period, and are sold separately or as a package. **Subscriptions governed by SiriusXM Customer Agreement; see www.siriusxm.com. If you decide to continue your XM service at the end of your complimentary trial, the plan you choose will automatically renew and bill at then-current rates until you call 1-866-635-2349 to cancel.** Fees and programming subject to change. Available only to those at least 18 years of age in the 48 contiguous United States and D.C. ©2013 Toyota Motor Sales, U.S.A., Inc.

VISIONS



Sebastião Salgado, South Georgia, 2009 *Two black-browed albatrosses nestle in their colony. This monochrome image and the two that follow are from the photographer's Genesis book project. In 32 countries over eight years, he documented "what is still pristine…what we must hold and protect."*

AMAZONAS-CONTACT PRESS IMAGES



Sebastião Salgado, Siberia, Russia, 2011 *The Nenets—40,000-plus indigenous herders—have been called the real cowboys of Siberia. Though losing their land and being pressured to settle, many still move their reindeer 620 miles each year, from winter pastures to summer grazing land, then back.*

AMAZONAS-CONTACT PRESS IMAGES

Sebastião Salgado, Papua, Indonesia, 2010 *Living in the rugged Jayawijaya Mountains, the tribal Yali were shielded from modernity until the 1970s. In this ceremonial scene men cook pigs in an oven—stones heated by firewood, then placed in a pit—while women collect leaves to flavor food.*

AMAZONAS-CONTACT PRESS IMAGES

NOW'S THE TIME TO HELP PROTECT YOURSELF WITH **THE SHINGLES VACCINE**



NO MATTER HOW HEALTHY YOU FEEL, SHINGLES COULD STILL HAPPEN TO YOU.

ZOSTAVAX®

Zoster Vaccine Live

Shingles is caused by the same virus that causes chickenpox. The virus stays in your body and can resurface at any time as Shingles — a painful, blistering rash. And no matter how healthy you feel, your risk increases as you get older.



Actual clinical rash image

The sooner you get vaccinated with ZOSTAVAX, the better your chances of protecting yourself from Shingles. In fact, the ACIP* of the CDC (Centers for Disease Control and Prevention) recommends that appropriate adults 60 years of age and older get vaccinated to help prevent Shingles.

***ACIP=Advisory Committee on Immunization Practices**

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Talk to your health care professional to see if ZOSTAVAX® (Zoster Vaccine Live) is right for you.

ZOSTAVAX is given as a single shot. ZOSTAVAX cannot be used to treat Shingles, or the nerve pain that may follow Shingles, once you have it. For more information, visit ZOSTAVAX.com or call 1-877-9 SHINGLES.

ABOUT *ZOSTAVAX*

ZOSTAVAX is a vaccine that is used for adults 50 years of age or older to prevent Shingles (also known as zoster).

IMPORTANT SAFETY INFORMATION

ZOSTAVAX does not protect everyone, so some people who get the vaccine may still get Shingles.

You should not get ZOSTAVAX if you are allergic to any of its ingredients, including gelatin or neomycin, have a weakened immune system, take high doses of steroids, or are pregnant or plan to become pregnant. You should not get ZOSTAVAX to prevent chickenpox.

Talk to your health care professional if you plan to get ZOSTAVAX at the same time as PNEUMOVAX®23 (Pneumococcal Vaccine Polyvalent) because it may be better to get these vaccines at least 4 weeks apart.

Possible side effects include redness, pain, itching, swelling, hard lump, warmth, or bruising at the injection site, as well as headache.

ZOSTAVAX contains a weakened chickenpox virus. Tell your health care professional if you will be in close contact with newborn infants, someone who may be pregnant and has not had chickenpox or been vaccinated against chickenpox, or someone who has problems with their immune system. Your health care professional can tell you what situations you may need to avoid.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

Please read the Patient Information on the adjacent page for more detailed information.

BEFORE YOU GET SHINGLES, GET VACCINATED.

MERCK

Patient Information about ZOSTAVAX® (pronounced "ZOS tah vax") Generic name: Zoster Vaccine Live

9989115

You should read this summary of information about ZOSTAVAX before you are vaccinated. If you have any questions about ZOSTAVAX after reading this page, you should ask your health care provider. This information does not take the place of talking about ZOSTAVAX with your doctor, nurse, or other health care provider. Only your health care provider can decide if ZOSTAVAX is right for you.

What is ZOSTAVAX and how does it work?
ZOSTAVAX is a vaccine that is used for adults 50 years of age or older to prevent shingles (also known as zoster).

ZOSTAVAX contains a weakened chickenpox virus (varicella-zoster virus).

ZOSTAVAX works by helping your immune system protect you from getting shingles.

If you do get shingles even though you have been vaccinated, ZOSTAVAX may help prevent the nerve pain that can follow shingles in some people. ZOSTAVAX does not protect everyone, so some people who get the vaccine may still get shingles.

ZOSTAVAX cannot be used to treat shingles, or the nerve pain that may follow shingles, once you have it.

What do I need to know about shingles and the virus that causes it?
Shingles is caused by the same virus that causes chickenpox. Once you have had chickenpox, the virus can stay in your nervous system for many years. For reasons that are not fully understood, the virus may become active again and give you shingles. Age and problems with the immune system may increase your chances of getting shingles.

Shingles is a rash that is usually on one side of the body. The rash begins as a cluster of small red spots that often blister. The rash can be painful. Shingles rashes usually last up to 30 days and, for most people, the pain associated with the rash lessens as it heals.

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Who should not get ZOSTAVAX?
You should not get ZOSTAVAX if you:
- are allergic to any of its ingredients.
- are allergic to gelatin or neomycin.
- have a weakened immune system (for example, an immune deficiency, leukemia, lymphoma, or HIV/AIDS).
- take high doses of steroids by injection or by mouth.
- are pregnant or plan to get pregnant.

You should not get ZOSTAVAX to prevent chickenpox.

Children should not get ZOSTAVAX.

How is ZOSTAVAX given?
ZOSTAVAX is given as a single dose by injection under the skin.

What should I tell my health care provider before I get ZOSTAVAX?
You should tell your health care provider if you:
- have or have had any medical problems.
- take any medicines, including non-prescription medicines, and dietary supplements.
- have any allergies, including allergies to neomycin or gelatin.
- had an allergic reaction to another vaccine.
- are pregnant or plan to become pregnant.
- are breast-feeding.

Tell your health care provider if you expect to be in close contact (including household contact) with newborn infants, someone who may be pregnant and has not had chickenpox or been vaccinated against chickenpox, or someone who has problems with their immune system. Your health care provider can tell you what situations you may need to avoid.

Can I get ZOSTAVAX with other vaccines?
Talk to your health care provider if you plan to get ZOSTAVAX at the same time as the flu vaccine.

Talk to your health care provider if you plan to get ZOSTAVAX at the same time as PNEUMOVAX®23 (Pneumococcal Vaccine Polyvalent) because it may be better to get these vaccines at least 4 weeks apart.

.

What are the possible side effects of ZOSTAVAX?
The most common side effects that people in the clinical studies reported after receiving the vaccine include:
- redness, pain, itching, swelling, hard lump, warmth, or bruising where the shot was given.
- headache

The following additional side effects have been reported with ZOSTAVAX:
- allergic reactions, which may be serious and may include difficulty in breathing or swallowing. If you have an allergic reaction, call your doctor right away.
- chickenpox
- fever
- hives at the injection site
- joint pain
- muscle pain
- nausea
- rash
- rash at the injection site
- swollen glands near the injection site (that may last a few days to a few weeks)

Tell your health care provider if you have any new or unusual symptoms after you receive ZOSTAVAX. For a complete list of side effects, ask your health care provider.

Call 1-800-986-8999 to report any exposure to ZOSTAVAX during pregnancy.

What are the ingredients of ZOSTAVAX?
Active Ingredient: a weakened form of the varicella-zoster virus.

Inactive Ingredients: sucrose, hydrolyzed porcine gelatin, sodium chloride, monosodium L-glutamate, sodium phosphate dibasic, potassium phosphate monobasic, potassium chloride.

This page summarizes important information about ZOSTAVAX. If you would like more information, talk to your health care provider or visit the website at www.ZOSTAVAX.com or call 1-800-622-4477.

Rx only

Issued June 2011

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VISIONS | YOUR SHOT

This section features photographs chosen by our editors and one chosen by our readers via online voting. For more information, go to *yourshot.nationalgeographic.com.*



EDITORS' CHOICE **Liam Carroll** Galway, Ireland

Carroll took an overnight bus while visiting Bolivia to see the Carnaval de Oruro, a celebration that reflects the region's religious history. Hundreds of dancers filled the plaza. Carroll pointed his camera toward one group that danced with fireworks to impress the country's president.



READERS' CHOICE

Nick Pandev
London, England

On a vacation to Iceland to photograph the aurora borealis, Pandev looked for three main elements: the aurora, a compelling landscape, and water to reflect the colors. Just after midnight near Kirkjufell mountain, he found all three.

Should be comfortable with:

FROSTBITE,

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AND NERVE DAMAGE

IN FINGERS

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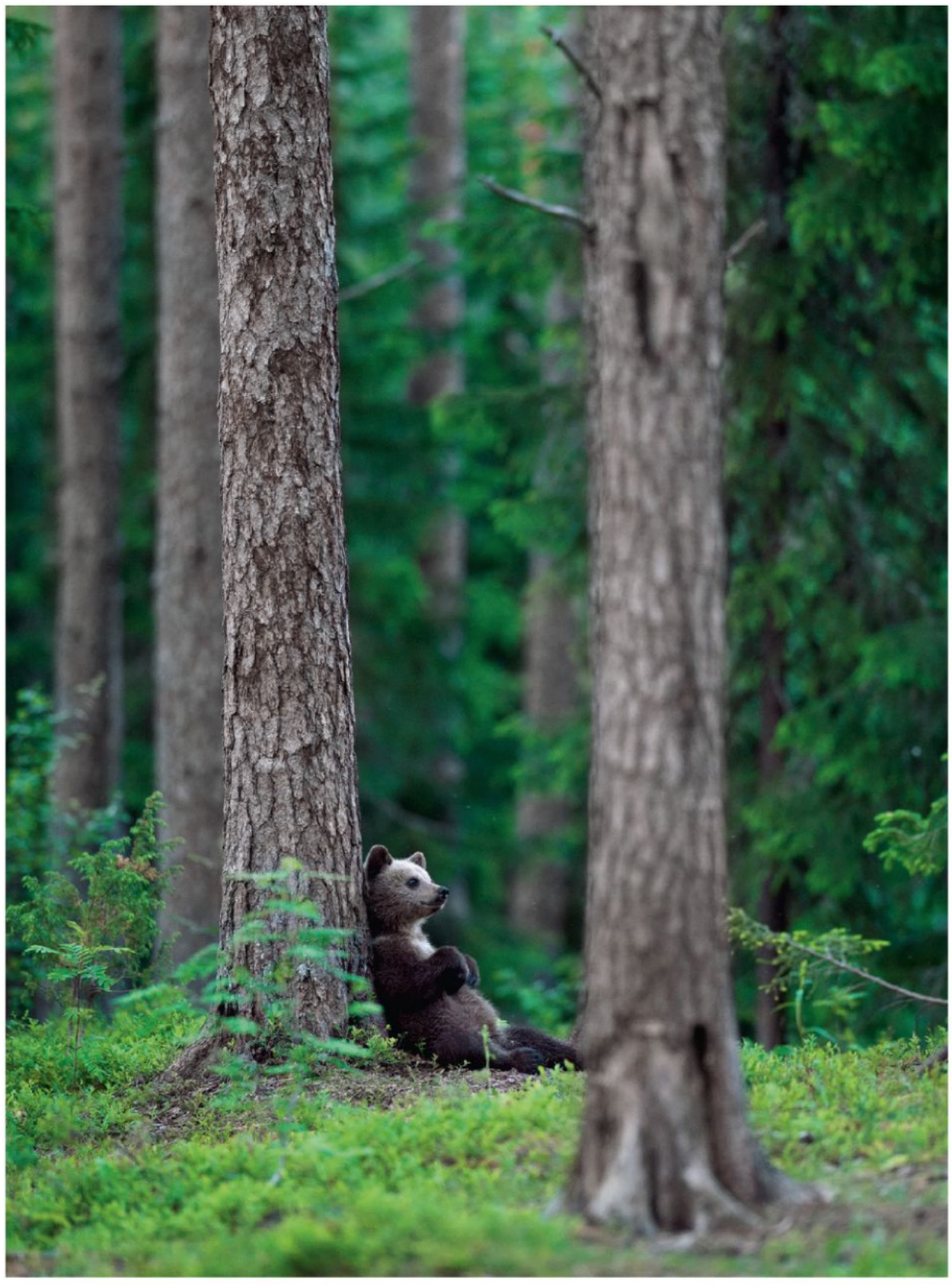
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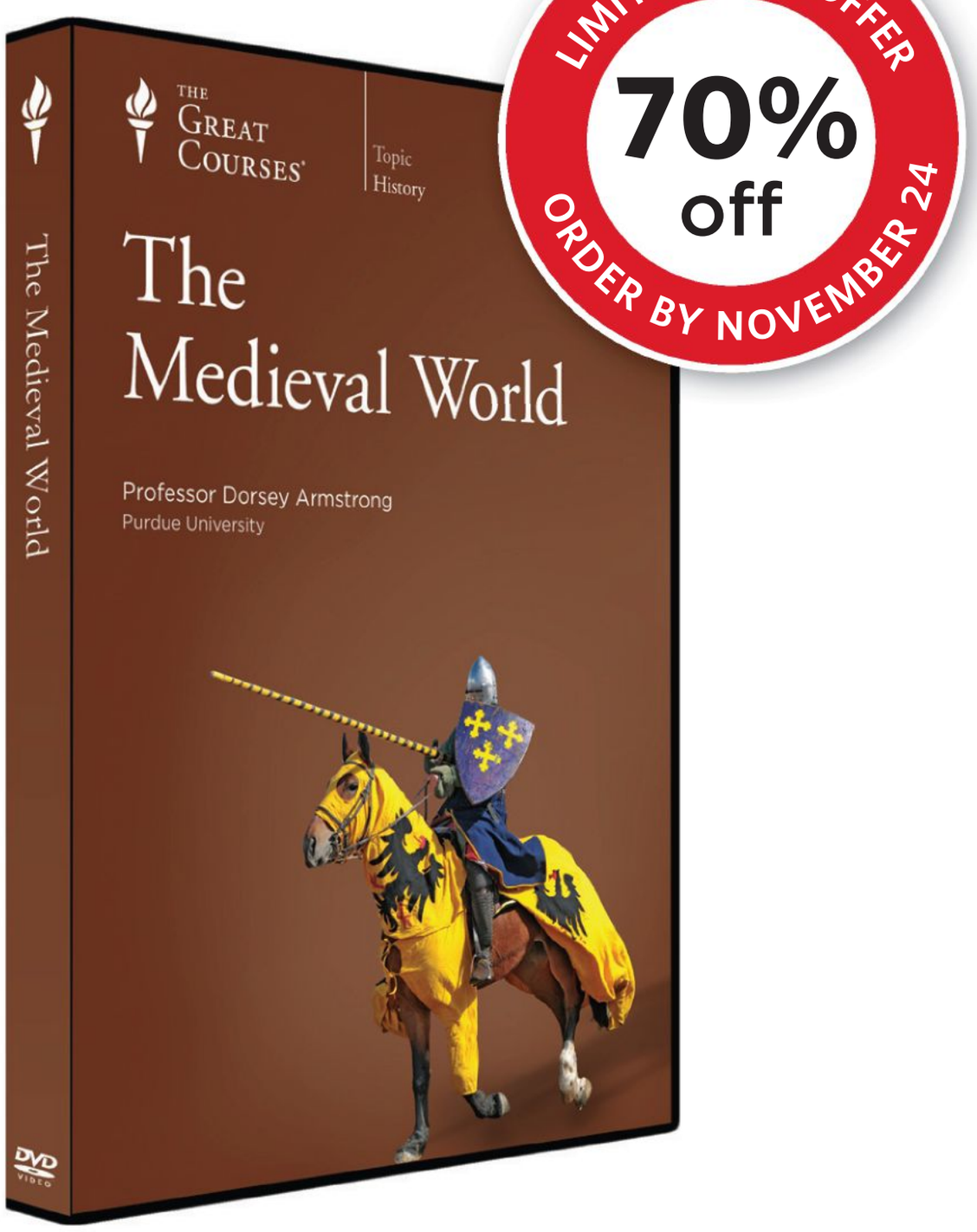
During a road trip with his family through northern India, Karmakar noticed how his son's face looked behind the reflection of mountains and clouds on the car's window. The image, he recalls, was like a surreal painting.



Erik Mandre Kiia, Estonia

Early last summer Mandre, a lawyer, used a camouflaged shelter in a forest in Finland near the Russian border to photograph brown bear cubs. The cubs played feverishly, then one of them left the group for a few minutes to relax on its own.

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Kelsi Wilkes
Englewood, Colorado

During the dry Colorado winter Wilkes wanted to create a light portrait with the most colorful fruit she could find. After slicing lemons, oranges, and pomegranates thinly to allow light to pass through, she arranged them on a sheet of Plexiglas, then pointed her camera downward.



Hideyuki Katagiri Kasukabe, Japan

Katagiri went to the Omiya train station in Saitama, Japan, to capture the types of emotions—joy, hope, sorrow—that are visible on travelers' faces. As one particularly popular train painted with stripes began to leave the station, Katagiri caught a quiet moment of a conductor at work.

New Tricks

Research into Dogs' Behavior



Appraising the emotional state of your dog "is not always rocket science," says François Martin, an animal behavioral scientist for Purina. "Every pet owner knows that when a dog wags its tail and displays the 'play bow,' he's happy."

Dr. Martin and his team are seeking to describe and quantify canine emotions by linking behaviors such as body posture with physiology and endocrinology. "We know that behaviors don't always correlate 100 percent with internal emotional states." To get a complete picture, Purina researchers are combining observation with other kinds of measures, including changes in body temperature, heartbeat, hormones such as cortisol, microflora, and more. "No single measure provides us with the big picture," he says.

There have been revelations during the five years Dr. Martin has headed up this research project. "There was construction going on next door to our pet care center one day when we were observing them in a play context." When the scientists looked at the dogs' physiological measurements the next day, they were astonished to see a pronounced spike in heart rate. "The video recordings showed a huge crane at the construction site. When the crane moved, the heart rates increased. The dogs' behavior continued to be positive, but obviously their nervous systems reacted."

Purina's findings suggest that even though the influence may not be obvious in their outward behavior, dogs can be impacted by external factors, both negative and positive. "Dog owners might be surprised to see videos of themselves preparing and presenting food to their pet," says Dr. Martin. Your engagement with your pet contributes to enjoyment of the meal beyond the anticipation of eating—and you can see it in your dog's behavior. That's an experiment you can try at home with your smart phone and a willing cinematographer.

Clearly, the pleasures of eating are enhanced by positive dog/owner interaction. Purina's behavioral studies are designed not only to help create diets that provide unsurpassed nutrition for your dogs, but also, as Dr. Martin says, to "provide insights so pet owners can help keep their dog's body and mind in optimal health."

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Maddie the coonhound balances on a friend's feet. Most of my photos of her happen on the spur of the moment.

Dog Days In 2011 I set out to do a photo project, traveling to every state in America to tell the stories of everyday folks, every single day for a year. Before I left, I realized I needed a dog for my adventures. I knew I wanted a coonhound, and found Maddie in an Atlanta, Georgia, shelter, but I still wasn't sure. As I walked her back to her kennel, though, she pressed her body against me the whole time. And I thought, Oh my gosh, I can't put you back in the cage. So $40 later, I'd rescued this dog I'd just met. Since then Maddie's been with me 24/7, next to me in the front seat of my truck, getting noseprints on the windows.

It was during that year on the road with her that I discovered Maddie's talent for perching. I'd take pictures of her in different situations with my iPhone and put them on Instagram to share. Maddie has an incredible patience, and she's also very food driven, so it's easy to get her to stay still for a photo. Sometimes she starts drooling during a pose because she knows she is going to get fed.

THE PHOTOGRAPHER

Theron Humphrey's book Maddie on Things *was published this year by Chronicle Books. His new project is to shoot animal rescue success stories in all 50 states. Learn more at* whywerescue.com. *Follow him on Instagram: @thiswildidea.*

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Theron Humphrey





We were at a friend's restaurant in Atlanta after hours and thought Maddie drinking coffee would be a good picture. I put her paws up on the table, he poured the coffee, and then—on the third shot—she yawned. It was a serendipitous moment where everything fell into place.

Halloween was coming, so I thought I'd do a series of Maddie in costumes. I shot one with her wearing vampire teeth and then this with her dressed as a ghost. There's something so great about a blanket ghost. First I just cut the eyeholes, but then I realized her snout had to be out too.

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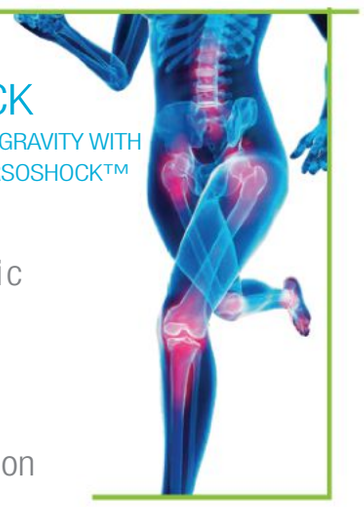
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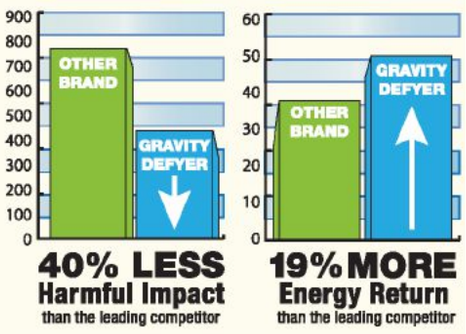
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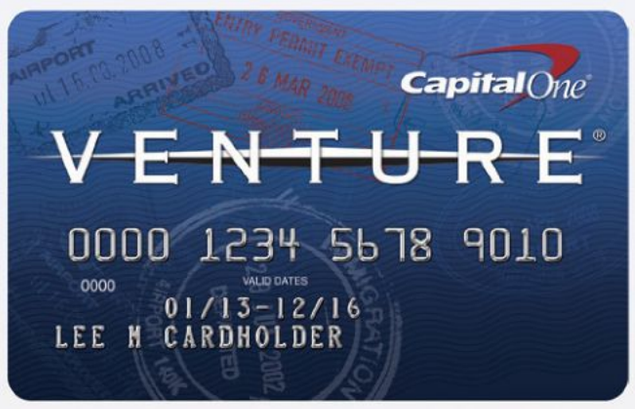
We were in Austin, Texas, for the South by Southwest Music Festival. I was crashing at my buddy's house and saw his empty guitar case. I asked Maddie to sit in it, then to lie down. And she pretty much just fell asleep there. When I told her she could get up, she just looked at me.

Driving past this giant watermelon in Hattiesburg, Mississippi, I thought, There's something you don't see every day. So I whipped the truck around, went right back, and put Maddie in the middle. I believe everything is a little more adorable when there's a dog on top.

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Theron Humphrey



In Columbus, Indiana, I was hanging out with my old college roommate, who was big into skateboarding. He said, “Do you think Maddie could stand on a skateboard?” And I said, “Oh yeah, absolutely.” I just put Maddie on top and said, “Stay.”

Maddie has great balance and is a really strong dog. This is the stairway going up to my buddy’s studio in Atlanta. I wondered if Maddie could stretch across it—and it turns out she could.



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NEXT

SKYCAST

Overhead this month in parts of the world

Early October
Comet ISON visible

October 18
Penumbral lunar eclipse



Baby Pictures

"The number one thing parents want to see is if babies have ten fingers and ten toes," says engineer Karl-Heinz Lumpi. His team developed software that shows the digits in full-color 3-D. Beyond allaying parents' curiosity, the more exact image of what's going on in the womb may play a role in diagnostics. Doctors who were formerly resigned to a blurred heartbeat can now see inside that organ's chambers.

It's all in the lighting. The image starts out like a traditional 3-D ultrasound's. Then a computer program adds virtual illumination, mimicking how light plays across human skin—reflecting, casting shadows, and giving shape. As in regular photography, the light source is movable. Plus the image is rotatable, so wriggling fingers, or a floating umbilical cord like this eight-month fetus's, likely won't hinder a thorough exam. *—Johnna Rizzo*

PHOTO: BERNARD BENOIT, SCIENCE SOURCE

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Elk Meadows, Yellowstone National Park



GORDON WILTSIE

National Geographic Photographer on America's National Parks

MY LOVE FOR NATIONAL PARKS

My mother jokingly ascribed my lifelong passions for wilderness, adventure, and photography to hearing the clanking sounds made by their mountain-climbing gear while she and my father camped in **YOSEMITE** just before I was born. They loved national parks and throughout my youth we visited numerous ones: **ZION, DEATH VALLEY, GRAND CANYON,** and many others. Our favorite was **YELLOWSTONE,** where we'd stare transfixed from the car, looking for bears that might be up any tree and constantly surprised by other creatures like elk, moose, and bison. Just as exciting were supernatural geysers, hot springs, and waterfalls that appeared around almost every bend. The park became a part of me and later it helped inspire my wife and me to move our own family to Montana, from which our children, too, could discover its wonders. Even after traveling to some of the world's most spectacular places as a National Geographic photographer and explorer, I still delight when I take pictures there. Most recently I spotted these "wapiti"—whose then-velveteen antlers might soon lock in mating combat—bedded down like friends in flower-filled **ELK MEADOWS,** a paradise preserved not just to nourish animals, but also the human soul.

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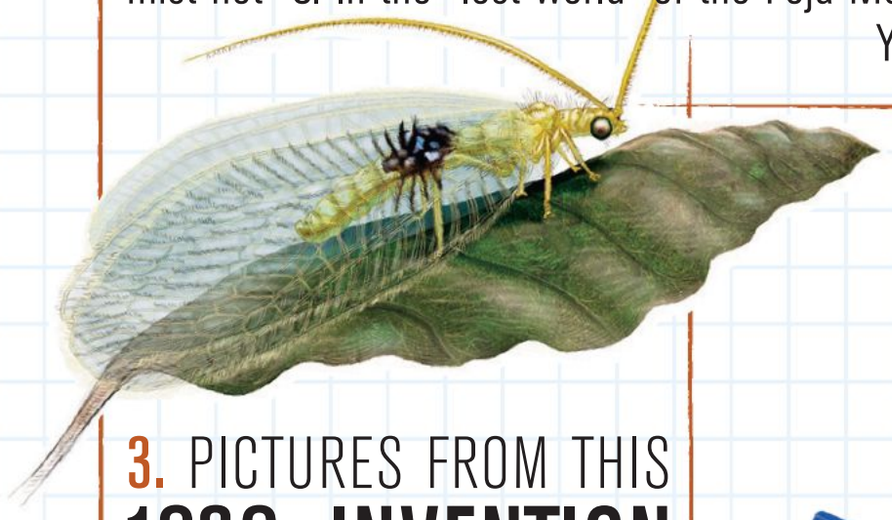
This quiz is the sixth of seven to run in 2013 to celebrate National Geographic's 125th anniversary. The next quiz will appear in December.

THROUGH THE LENS

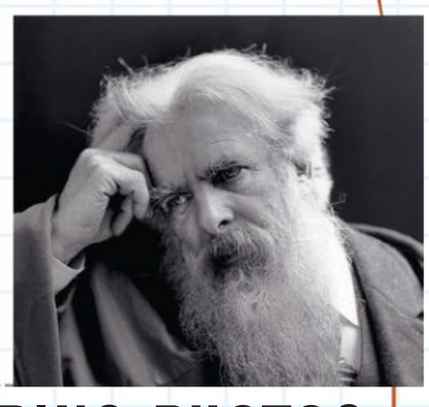
People have been exploring the world with cameras almost since the invention of the daguerreotype in the 1830s, and their images have taken us from the fetus in the womb to the farther reaches of outer space. "The camera," American photographer Dorothea Lange once said, "is an instrument that teaches people how to see without a camera." It has changed what we think and who we are. This quiz is a snapshot of that change.

1. SCIENTISTS RECENTLY DISCOVERED A BEAUTIFUL NEW SPECIES OF **GREEN LACEWING**

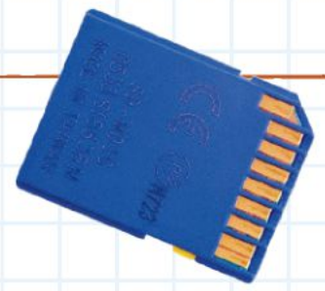
HIDING IN PLAIN SIGHT. WHERE DID THEY FIND IT? A. On a website B. In the mouth of a bird trapped in a mist net C. In the "lost world" of the Foja Mountains D. In Yankee Stadium



2. IN 1872 BRITISH PHOTOGRAPHER **EADWEARD MUYBRIDGE** PRODUCED A VISUAL ANSWER TO AN AGE-OLD **BIOLOGICAL QUESTION.** WHAT DID HE PHOTOGRAPH? A. A cuckoo hatchling pushing eggs out of its nest B. A barn owl seizing its prey C. A running horse D. A pollywog morphing into a frog



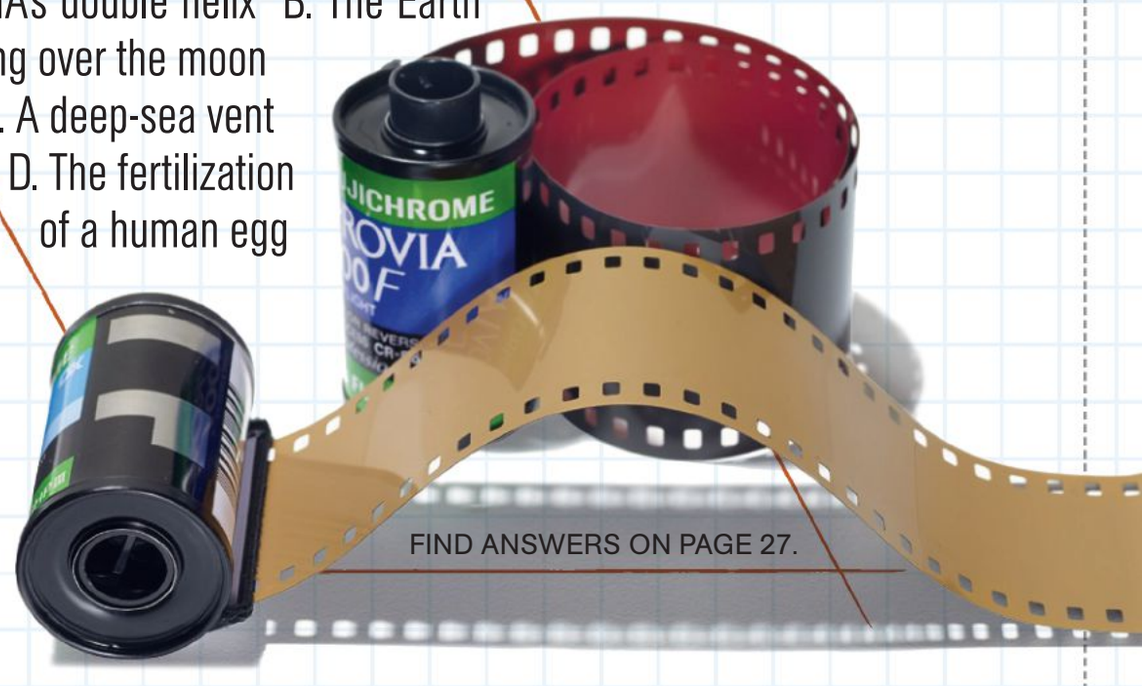
3. PICTURES FROM THIS **1930s INVENTION** HAVE DRAMATICALLY **CHANGED SCIENTIFIC DISCOVERY.** WHAT IS THE DEVICE? A. The zoom lens B. The electron microscope C. The Polaroid camera D. The magnetic resonance imaging machine



4. **SHARING PHOTOS ON THE WEB** IS NOW COMMONPLACE, BUT WHAT DID THE FIRST UPLOADED PHOTO DEPICT? A. Senator Al Gore at the 1992 Democratic National Convention B. A physics-themed, all-female rock group C. MC Hammer singing "U Can't Touch This" D. Harvard's first female tenured professor of physics

5. NAME THE PHOTOGRAPHER WHOSE BRASH REMARK **"SOMETIMES I ARRIVE JUST WHEN GOD'S READY TO HAVE SOMEONE CLICK THE SHUTTER"** WAS BORNE OUT BY THE PICTURES HE MADE. A. Edward Steichen B. Walker Evans C. Henri Cartier-Bresson D. Ansel Adams

6. **"PHOTOGRAPH 51"** ALLOWED US TO VIEW WHAT PHENOMENON FOR THE FIRST TIME? A. DNA's double helix B. The Earth rising over the moon C. A deep-sea vent D. The fertilization of a human egg



FIND ANSWERS ON PAGE 27.

CUT HERE

HANNAH TAK, NGM STAFF. ART: MESA SCHUMACHER. PHOTOS, FROM TOP RIGHT: RISCHGITZ/HULTON ARCHIVE/GETTY IMAGES; DAVID J. GREEN, ALAMY; MARK THIESSEN, NGM STAFF

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What is the most important information I should know about ELIQUIS (apixaban)?

Do not stop taking ELIQUIS without talking to the doctor who prescribed it for you. Stopping ELIQUIS increases your risk of having a stroke. ELIQUIS may need to be stopped, prior to surgery or a medical or dental procedure. Your doctor will tell you when you should stop taking ELIQUIS and when you may start taking it again. If you have to stop taking ELIQUIS, your doctor may prescribe another medicine to help prevent a blood clot from forming.

ELIQUIS can cause bleeding which can be serious, and rarely may lead to death. This is because ELIQUIS is a blood thinner medicine that reduces blood clotting.

You may have a higher risk of bleeding if you take ELIQUIS and take other medicines that increase your risk of bleeding, such as aspirin, nonsteroidal anti-inflammatory drugs (called NSAIDs), warfarin (COUMADIN®), heparin, selective serotonin reuptake inhibitors (SSRIs) or serotonin norepinephrine reuptake inhibitors (SNRIs), and other medicines to help prevent or treat blood clots.

Tell your doctor if you take any of these medicines. Ask your doctor or pharmacist if you are not sure if your medicine is one listed above.

While taking ELIQUIS:

- you may bruise more easily
- it may take longer than usual for any bleeding to stop

Call your doctor or get medical help right away if you have any of these signs or symptoms of bleeding when taking ELIQUIS:

- unexpected bleeding, or bleeding that lasts a long time, such as:
 - unusual bleeding from the gums
 - nosebleeds that happen often
 - menstrual bleeding or vaginal bleeding that is heavier than normal
- bleeding that is severe or you cannot control
- red, pink, or brown urine
- red or black stools (looks like tar)
- cough up blood or blood clots
- vomit blood or your vomit looks like coffee grounds
- unexpected pain, swelling, or joint pain
- headaches, feeling dizzy or weak

ELIQUIS (apixaban) is not for patients with artificial heart valves.

What is ELIQUIS?

ELIQUIS is a prescription medicine used to reduce the risk of stroke and blood clots in people who have atrial fibrillation.

It is not known if ELIQUIS is safe and effective in children.

Who should not take ELIQUIS?

Do not take ELIQUIS if you:

- currently have certain types of abnormal bleeding
- have had a serious allergic reaction to ELIQUIS. Ask your doctor if you are not sure

What should I tell my doctor before taking ELIQUIS?

Before you take ELIQUIS, tell your doctor if you:

- have kidney or liver problems
- have any other medical condition
- have ever had bleeding problems
- are pregnant or plan to become pregnant. It is not known if ELIQUIS will harm your unborn baby
- are breastfeeding or plan to breastfeed. It is not known if ELIQUIS passes into your breast milk. You and your doctor should decide if you will take ELIQUIS or breastfeed. You should not do both

Tell all of your doctors and dentists that you are taking ELIQUIS. They should talk to the doctor who prescribed ELIQUIS for you, before you have **any** surgery, medical or dental procedure.

Tell your doctor about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Some of your other medicines may affect the way ELIQUIS works. Certain medicines may increase your risk of bleeding or stroke when taken with ELIQUIS.

How should I take ELIQUIS (apixaban)?

Take ELIQUIS exactly as prescribed by your doctor. Take ELIQUIS twice every day with or without food, and do not change your dose or stop taking it unless your doctor tells you to. If you miss a dose of ELIQUIS, take it as soon as you remember, and do not take more than one dose at the same time. **Do not run out of ELIQUIS. Refill your prescription before you run out. Stopping ELIQUIS may increase your risk of having a stroke.**

What are the possible side effects of ELIQUIS?

- See **"What is the most important information I should know about ELIQUIS?"**
- ELIQUIS can cause a skin rash or severe allergic reaction. Call your doctor or get medical help right away if you have any of the following symptoms:
 - chest pain or tightness
 - swelling of your face or tongue
 - trouble breathing or wheezing
 - feeling dizzy or faint

Tell your doctor if you have any side effect that bothers you or that does not go away.

These are not all of the possible side effects of ELIQUIS. For more information, ask your doctor or pharmacist.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

This is a brief summary of the most important information about ELIQUIS. For more information, talk with your doctor or pharmacist, call 1-855-ELIQUIS (1-855-354-7847), or go to www.ELIQUIS.com.

Manufactured by:
Bristol-Myers Squibb Company
Princeton, New Jersey 08543 USA
Marketed by:
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This independent, non-profit organization provides assistance to qualifying patients with financial hardship who generally have no prescription insurance. Contact 1-800-736-0003 or visit www.bmspaf.org for more information.

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Brownie Mix

“Bring Along a Brownie,” the ad copy read, and in 1900, the year of its introduction, 150,000 people did. By 1907 more than a million had been sold. Named the Brownie after characters in a series of 19th-century children’s books, the easy-to-use camera was the brainchild of George Eastman, founder of the Eastman Kodak Company. It originally sold for a dollar and put photography within the reach of everyone—including Ansel Adams, whose first camera, a Brownie, was presented to him by his parents on a family trip to Yosemite.

Until its demise in 1970 it was the camera of memories, used to take pictures of weddings, high school graduations, pets, babies, birthday parties, Halloween trick-or-treaters, and countless Kodak moments. Before the Brownie, photography was an elite, expensive pursuit. The Brownie changed all that. “Kodak wasn’t just selling a camera, it was selling a wholesome way of life,” says George Eastman House curator Todd Gustavson. To bring out the Brownie was to confer on any event the status of special occasion. Through its viewfinder we learned how—and what—to remember. *—Cathy Newman*

1909



1929



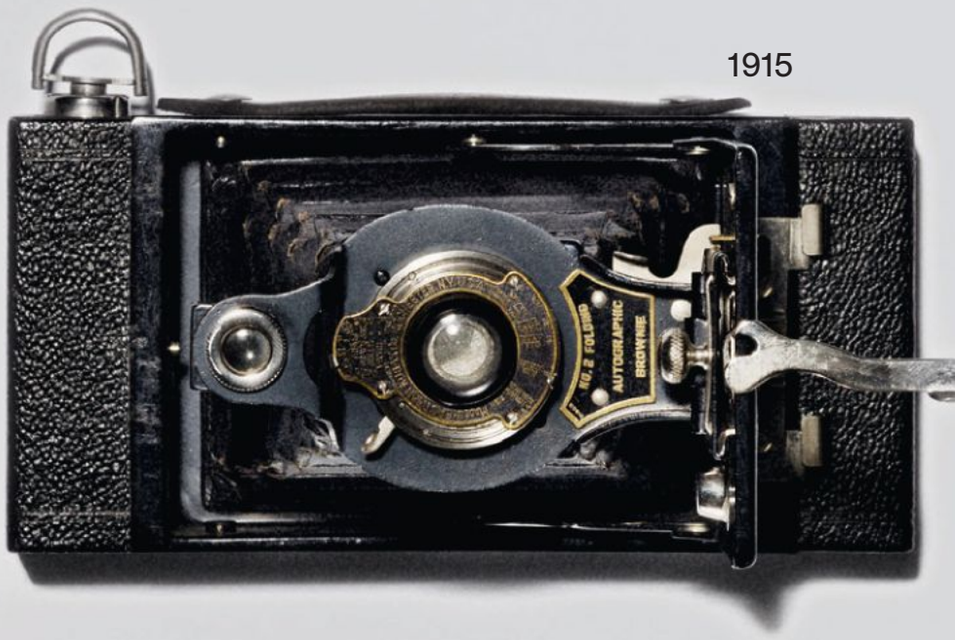
1955



1957



1915



1946

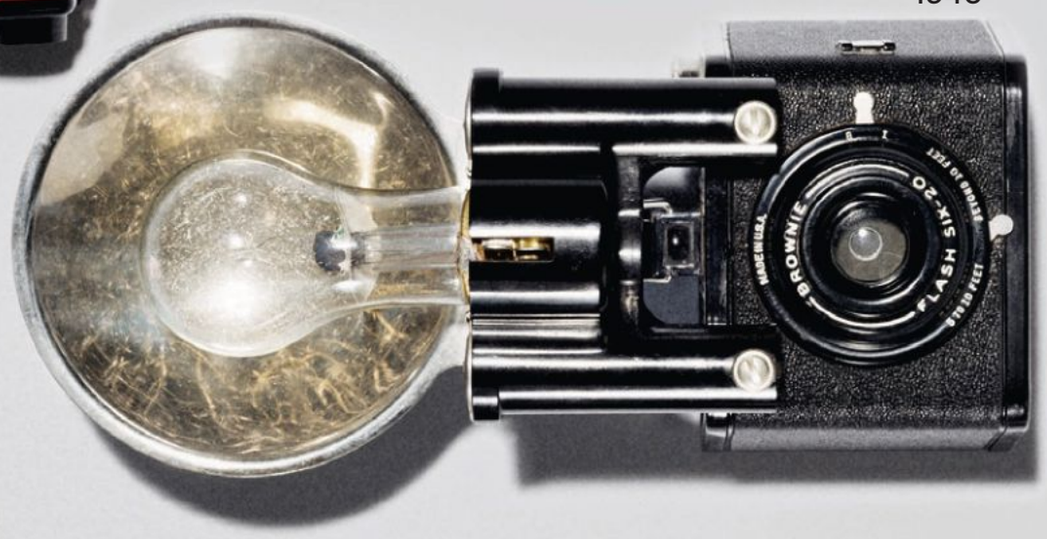
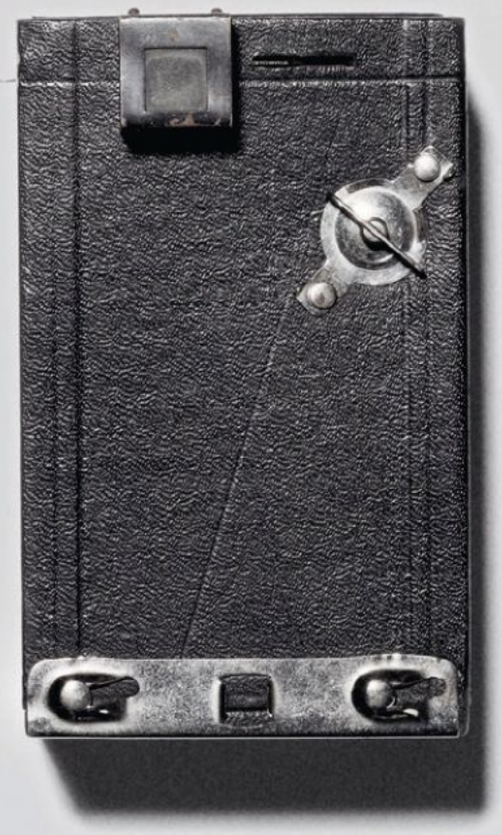


PHOTO: CRAIG CUTLER. CAMERAS COURTESY GEORGE EASTMAN HOUSE

1929



1900



1905



1949



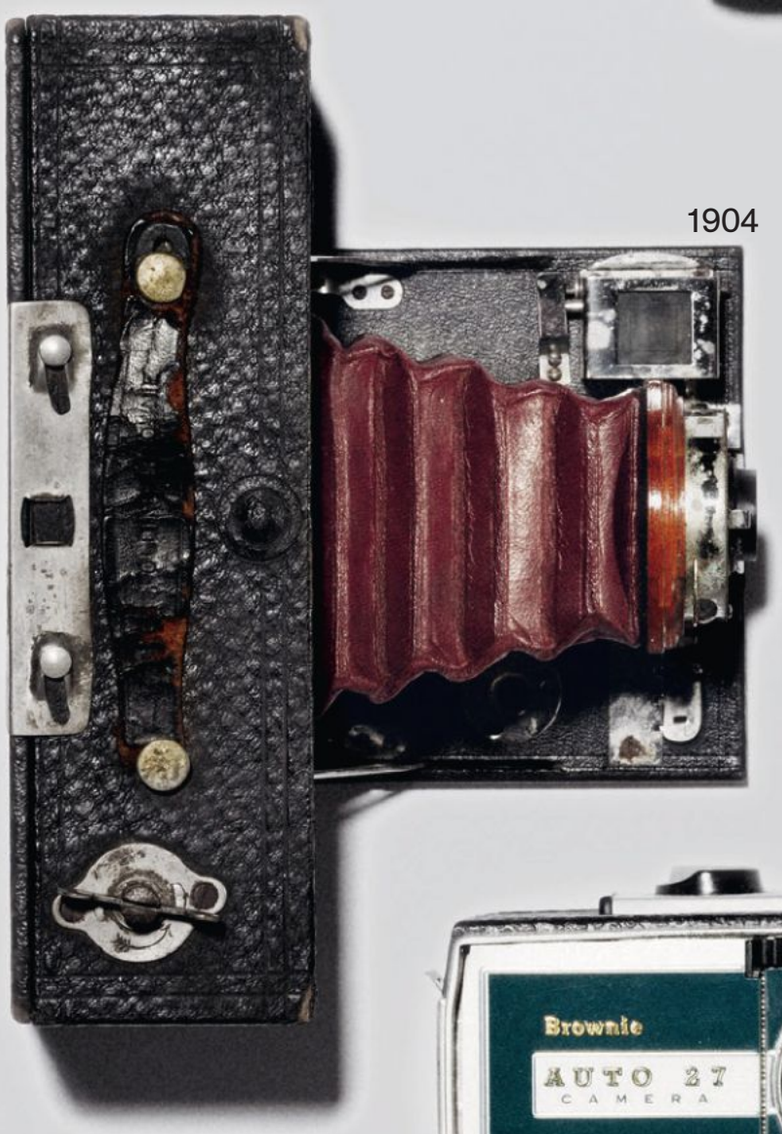
1960



1950



1904



1963



1934



The original Brownie (1900) evolved into more than 170 different versions in the course of its history.

advertisement

ON ASSIGNMENT

ANNIE GRIFFITHS | MAPPING YOUR FUTURE



LITTLE DID I KNOW, WHEN I GOT MY FIRST NATIONAL GEOGRAPHIC ASSIGNMENT IN AFRICA, THAT I WAS BEGINNING A JOURNEY THAT WOULD TAKE ME TO MORE THAN 150 COUNTRIES AND INTO THE LIVES OF EXTRAORDINARY PEOPLE.

Over the years, I regularly witnessed the strength and resilience of poor women, even in the most difficult circumstances. These women were always planning for the future, to ensure that they had food, water, and shelter. For them, planning was essential to survival.

I came to recognize that any map of my future must include a plan to help these women. Over time, I gathered together a group of talented photographers and filmmakers and we started Ripple Effect Images, an aid organization that shines a light on the programs that empower women and girls in developing countries. I had learned, through my work at National Geographic, how powerful visual stories could be in raising awareness. By applying that storytelling model to innovative and sustainable programs for women and girls, I knew that we could make a real difference. And it worked!

Through careful research and planning, Ripple identifies aid programs that help empower women to access clean water, plant nutritious crops, market their goods, educate their children, and achieve a better future. We film these organizations in action and then donate the images and films to them to help them raise awareness and funding. Ripple has also developed a strategic plan to share these success stories with policymakers and agencies that support women's programming.

Studies have confirmed that if you help a woman or a girl, she will pay it forward to her children, her community, and her country. Like so many of us who are lucky enough to have work that we love, I found a way to pay that good fortune forward. My dream was that my photographs be useful, as well as beautiful. By thoughtfully mapping my own career as a photographer, I have been able to help women and girls plot their own paths to a promising future.





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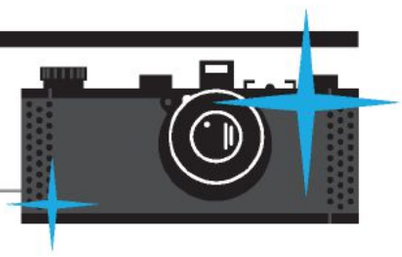
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NEXT

The most expensive camera ever sold was a rare 1923 Leica, which went for $2.8 million at auction in Vienna.

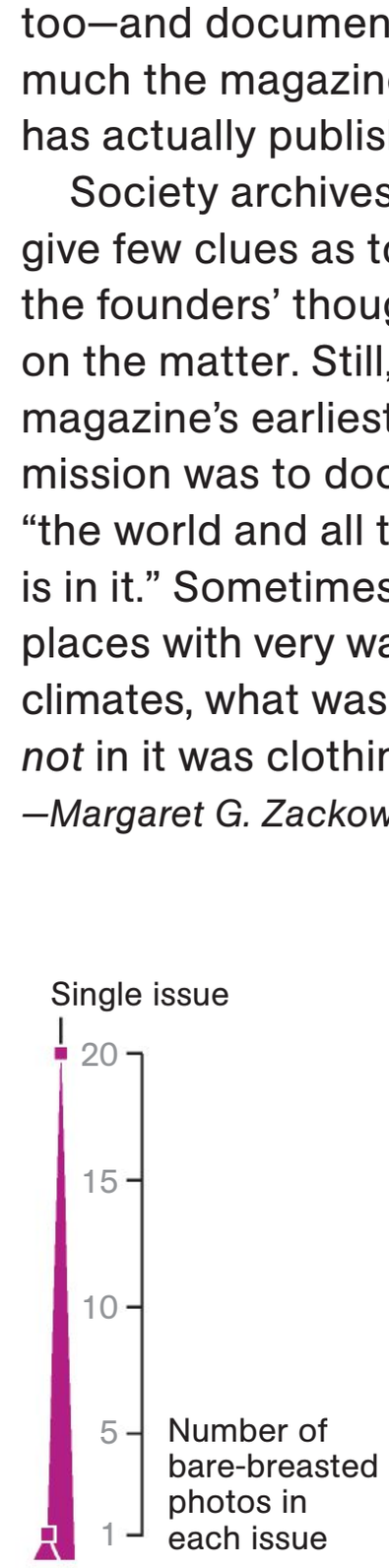


Naked Truth

Everybody always mentions the nudity in *National Geographic.* For this special issue on photography, we figured we should mention it too—and document how much the magazine has actually published.

Society archives give few clues as to the founders' thoughts on the matter. Still, the magazine's earliest mission was to document "the world and all that is in it." Sometimes, in places with very warm climates, what was *not* in it was clothing.

—Margaret G. Zackowitz



539

photos showing bare-breasted women have appeared in *National Geographic* magazine since 1896.



GRAPHICS: LAWSON PARKER, NGM STAFF; ÁLVARO VALIÑO (TOP)



For patients 12 years and older whose asthma is not well controlled on a long-term asthma medicine or whose disease severity warrants

IF YOU THINK ASTHMA 'COMES AND GOES'

THINK AGAIN.

IT'S MISUNDERSTOOD. ASTHMA DOESN'T COME AND GO. Inflammation, the root cause of asthma is always there, making your lungs more vulnerable to triggers. So, while it's important to avoid triggers, it's also important to treat this inflammation. SYMBICORT helps reduce the underlying inflammation. SYMBICORT helps keep airways open and improve lung function for better breathing all day and night.* SYMBICORT does not replace a rescue inhaler for sudden symptoms. Once your asthma is well controlled, your doctor will decide if you can stop taking SYMBICORT without loss of control and may prescribe a long-term asthma control medicine such as an inhaled corticosteroid.

* When taken twice daily.

Ask your doctor about SYMBICORT.

IMPORTANT INFORMATION ABOUT SYMBICORT

Important Safety Information About SYMBICORT for Asthma

SYMBICORT contains formoterol, a long-acting beta$_2$-adrenergic agonist (LABA). LABA medicines such as formoterol increase the risk of death from asthma problems. It is not known whether budesonide, the other medicine in SYMBICORT, reduces the risk of death from asthma problems seen with formoterol. SYMBICORT should be used only if your health care provider decides that your asthma is not well controlled with a long-term asthma control medicine, such as an inhaled corticosteroid, or that your asthma is severe enough to begin treatment with SYMBICORT.

If you are taking SYMBICORT, see your health care provider if your asthma does not improve or gets worse. It is important that your health care provider assess your asthma control on a regular basis. Your doctor will decide if it is possible for you to stop taking SYMBICORT and start taking a long-term asthma control medicine without loss of asthma control. Children and adolescents who take LABA medicines may have an increased risk of being hospitalized for asthma problems.

SYMBICORT does not replace rescue inhalers for sudden asthma symptoms.

Be sure to tell your health care provider about all your health conditions, including heart conditions or high blood pressure, and all medicines you may be taking. Some patients taking SYMBICORT may experience increased blood pressure, heart rate, or change in heart rhythm.

Do not use SYMBICORT more often than prescribed. While taking SYMBICORT, never use another medicine containing a LABA for any reason. Ask your health care provider or pharmacist if any of your other medicines are LABA medicines, as using too much LABA may cause chest pain, increase in blood pressure, fast and irregular heartbeat, headache, tremor, and nervousness.

Patients taking SYMBICORT should call their health care provider or get emergency medical care:

- if you experience serious allergic reactions including rash, hives, swelling of the face, mouth and tongue, and breathing problems.
- if you think you are exposed to infections such as chicken pox or measles, or if you have any signs of infection. You may have a higher chance of infection.
- if you experience an increase in wheezing right after taking SYMBICORT, eye problems including glaucoma and cataracts, decreases in bone mineral density, swelling of blood vessels (signs include a feeling of pins and needles or numbness of arms or legs, flu like symptoms, rash, pain and swelling of the sinuses), decrease in blood potassium and increase in blood sugar levels.

If you are switching to SYMBICORT from an oral corticosteroid, follow your health care provider's instructions to avoid serious health risks when you stop using oral corticosteroids. Common side effects include nose and throat irritation, headache, upper respiratory tract infection, sore throat, sinusitis, stomach discomfort, flu, back pain, nasal congestion, vomiting, and thrush in the mouth and throat.

Approved Uses for SYMBICORT for Asthma

SYMBICORT is a medicine for the treatment of asthma for people 12 years and older whose doctor has determined that their asthma is not well controlled with a long term asthma control medicine such as an inhaled corticosteroid or whose asthma is severe enough to begin treatment with SYMBICORT. SYMBICORT is not a treatment for sudden asthma symptoms.

Please see Important Product Information on adjacent page and discuss with your doctor.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

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(budesonide/formoterol fumarate dihydrate)
Inhalation Aerosol

AstraZeneca

IMPORTANT INFORMATION ABOUT SYMBICORT

Please read this summary carefully and then ask your doctor about SYMBICORT.

No advertisement can provide all the information needed to determine if a drug is right for you or take the place of careful discussions with your health care provider. Only your health care provider has the training to weigh the risks and benefits of a prescription drug.

WHAT IS THE MOST IMPORTANT INFORMATION I SHOULD KNOW ABOUT SYMBICORT?

People with asthma who take long-acting beta$_2$-agonist (LABA) medicines, such as formoterol (one of the medicines in SYMBICORT), have an increased risk of death from asthma problems. It is not known whether budesonide, the other medicine in SYMBICORT, reduces the risk of death from asthma problems seen with formoterol.

SYMBICORT should be used only if your health care provider decides that your asthma is not well controlled with a long-term asthma control medicine, such as an inhaled corticosteroid, or that your asthma is severe enough to begin treatment with SYMBICORT. Talk with your health care provider about this risk and the benefits of treating your asthma with SYMBICORT.

If you are taking SYMBICORT, see your health care provider if your asthma does not improve or gets worse. It is important that your health care provider assess your asthma control on a regular basis. Your doctor will decide if it is possible for you to stop taking SYMBICORT and start taking a long-term asthma control medicine without loss of asthma control.

Get emergency medical care if:

- breathing problems worsen quickly, and
- you use your rescue inhaler medicine, but it does not relieve your breathing problems.

Children and adolescents who take LABA medicines may be at increased risk of being hospitalized for asthma problems.

WHAT IS SYMBICORT?

SYMBICORT is an inhaled prescription medicine used for asthma and chronic obstructive pulmonary disease (COPD). It contains two medicines:

- Budesonide (the same medicine found in Pulmicort Flexhaler™, an inhaled corticosteroid). Inhaled corticosteroids help to decrease inflammation in the lungs. Inflammation in the lungs can lead to asthma symptoms
- Formoterol (the same medicine found in Foradil® Aerolizer®). LABA medicines are used in patients with COPD and asthma to help the muscles in the airways of your lungs stay relaxed to prevent asthma symptoms, such as wheezing and shortness of breath. These symptoms can happen when the muscles in the airways tighten. This makes it hard to breathe, which, in severe cases, can cause breathing to stop completely if not treated right away

SYMBICORT is used for asthma and chronic obstructive pulmonary disease as follows:

Asthma

SYMBICORT is used to control symptoms of asthma and prevent symptoms such as wheezing in adults and children ages 12 and older.

Chronic Obstructive Pulmonary Disease

COPD is a chronic lung disease that includes chronic bronchitis, emphysema, or both. SYMBICORT 160/4.5 mcg is used long term, two times each day, to help improve lung function for better breathing in adults with COPD.

WHO SHOULD NOT USE SYMBICORT?

Do not use SYMBICORT to treat sudden severe symptoms of asthma or COPD or if you are allergic to any of the ingredients in SYMBICORT.

WHAT SHOULD I TELL MY HEALTH CARE PROVIDER BEFORE USING SYMBICORT?

Tell your health care provider about all of your health conditions, including if you:

- have heart problems
- have high blood pressure
- have seizures
- have thyroid problems
- have diabetes
- have liver problems
- have osteoporosis
- have an immune system problem
- have eye problems such as increased pressure in the eye, glaucoma, or cataracts
- are allergic to any medicines
- are exposed to chicken pox or measles
- **are pregnant or planning to become pregnant.** It is not known if SYMBICORT may harm your unborn baby
- **are breast-feeding.** Budesonide, one of the active ingredients in SYMBICORT, passes into breast milk. You and your health care provider should decide if you will take SYMBICORT while breast-feeding

Tell your health care provider about all the medicines you take including prescription and nonprescription medicines, vitamins, and herbal supplements. SYMBICORT and certain other medicines may interact with each other and can cause serious side effects. Know all the medicines you take. Keep a list and show it to your health care provider and pharmacist each time you get a new medicine.

HOW DO I USE SYMBICORT?

Do not use SYMBICORT unless your health care provider has taught you and you understand everything. Ask your health care provider or pharmacist if you have any questions.

Use SYMBICORT exactly as prescribed. **Do not use SYMBICORT more often than prescribed.** SYMBICORT comes in two strengths for asthma: 80/4.5 mcg and 160/4.5 mcg. Your health care provider will prescribe the strength that is best for you. SYMBICORT 160/4.5 mcg is the approved dosage for COPD.

- SYMBICORT should be taken every day as 2 puffs in the morning and 2 puffs in the evening.
- Rinse your mouth with water and spit the water out after each dose (2 puffs) of SYMBICORT. This will help lessen the chance of getting a fungus infection (thrush) in the mouth and throat.
- Do not spray SYMBICORT in your eyes. If you accidentally get SYMBICORT in your eyes, rinse your eyes with water. If redness or irritation persists, call your health care provider.
- Do not change or stop any medicines used to control or treat your breathing problems. Your health care provider will change your medicines as needed
- **While you are using SYMBICORT 2 times each day, do not use other medicines that contain a long-acting beta$_2$-agonist (LABA) for any reason. Ask your health care provider or pharmacist if any of your other medicines are LABA medicines.**
- SYMBICORT does not relieve sudden symptoms. Always have a rescue inhaler medicine with you to treat sudden symptoms. If you do not have a rescue inhaler, call your health care provider to have one prescribed for you.

Call your health care provider or get medical care right away if:

- your breathing problems worsen with SYMBICORT
- you need to use your rescue inhaler medicine more often than usual
- your rescue inhaler does not work as well for you at relieving symptoms
- you need to use 4 or more inhalations of your rescue inhaler medicine for 2 or more days in a row
- you use one whole canister of your rescue inhaler medicine in 8 weeks' time
- your peak flow meter results decrease. Your health care provider will tell you the numbers that are right for you
- your symptoms do not improve after using SYMBICORT regularly for 1 week

WHAT MEDICATIONS SHOULD I NOT TAKE WHEN USING SYMBICORT?

While you are using SYMBICORT, do not use other medicines that contain a long-acting beta$_2$-agonist (LABA) for any reason, such as:

- Serevent® Diskus® (salmeterol xinafoate inhalation powder)
- Advair Diskus® or Advair® HFA (fluticasone propionate and salmeterol)
- Formoterol-containing products such as Foradil Aerolizer, Brovana®, or Perforomist®

WHAT ARE THE POSSIBLE SIDE EFFECTS WITH SYMBICORT?

SYMBICORT can cause serious side effects.

- Increased risk of pneumonia and other lower respiratory tract infections if you have COPD. Call your health care provider if you notice any of these symptoms: increase in mucus production, change in mucus color, fever, chills, increased cough, increased breathing problems
- Serious allergic reactions including rash; hives; swelling of the face, mouth and tongue; and breathing problems. Call your health care provider or get emergency care if you get any of these symptoms
- Immune system effects and a higher chance for infections
- Adrenal insufficiency–a condition in which the adrenal glands do not make enough steroid hormones
- Cardiovascular and central nervous system effects of LABAs, such as chest pain, increased blood pressure, fast or irregular heartbeat, tremor, or nervousness
- Increased wheezing right after taking SYMBICORT
- Eye problems, including glaucoma and cataracts. You should have regular eye exams while using SYMBICORT
- Osteoporosis. People at risk for increased bone loss may have a greater risk with SYMBICORT
- Slowed growth in children. As a result, growth should be carefully monitored
- Swelling of your blood vessels. This can happen in people with asthma
- Decreases in blood potassium levels and increases in blood sugar levels

WHAT ARE COMMON SIDE EFFECTS OF SYMBICORT?

Patients with Asthma

Sore throat, headache, upper respiratory tract infection, thrush in the mouth and throat

Patients with COPD

Thrush in the mouth and throat

These are not all the side effects with SYMBICORT. Ask your health care provider or pharmacist for more information.

NOTE: This summary provides important information about SYMBICORT. For more information, please ask your doctor or health care provider.

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22913538

SUPER COUPON!

Item 46163 shown



15" x 13" ALL PURPOSE SHOP TOWELS PACK OF 50
LOT NO. 46163/68442/69649

SAVE 43%

$8.99
REG. PRICE $15.99

64169773

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SUPER COUPON!

US★GENERAL

580 LB. CAPACITY FOUR DRAWER TOOL CART
LOT NO. 95659/61634

SAVE $160

Item 95659 shown



$99.99
REG. PRICE $259.99

82176873

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SUPER COUPON!

CENTRALPNEUMATIC

2.5 HP, 21 GALLON, 125 PSI VERTICAL AIR COMPRESSOR
LOT NO. 67847/69091/61454

SAVE $70

$149.99
REG. PRICE $219.99

Item 67847 shown



29905311

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SUPER COUPON!

MECHANIC'S GLOVES

Item 93640 shown



SAVE 64%

YOUR CHOICE!
$3.59
REG. PRICE $9.99

MEDIUM
LOT NO. 61235

LARGE
LOT NO. 93640/60447

X-LARGE
LOT NO. 93641/60448

26694264

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SUPER COUPON!

ACCURACY WITHIN ±4%

TORQUE WRENCHES
PITTSBURGH PRO

"Impressive Accuracy, Amazing Value" – Car Craft Magazine



SAVE 71%

1/4" DRIVE
LOT NO. 2696/61277

3/8" DRIVE
LOT NO. 807/61276

1/2" DRIVE
LOT NO. 239

YOUR CHOICE! $9.99
REG. PRICE $34.99

Item 239 shown

84966601

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SUPER COUPON!

4-1/2" ANGLE GRINDER
drillmaster
LOT NO. 95578/69645/60625



Item 95578 shown

SAVE 50%

$9.99
REG. PRICE $19.99

27624117

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SUPER COUPON!

29 PIECE TITANIUM NITRIDE COATED DRILL BIT SET
drillmaster
LOT NO. 5889

SAVE 60%

$9.99
REG. PRICE $24.99



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SUPER COUPON!

AUTO-DARKENING WELDING HELMET WITH BLUE FLAME DESIGN
LOT NO. 91214/61610



Item 91214 shown

SAVE 50%

$39.99
REG. PRICE $79.99

CHICAGO ELECTRIC WELDING

39591282

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SUPER COUPON!

2.4" COLOR LCD DIGITAL INSPECTION CAMERA
CEN-TECH
LOT NO. 67979



Requires four AA batteries (included).

SAVE $62

$67.99
REG. PRICE $129.99

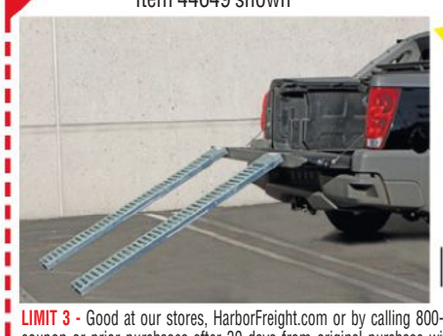
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SUPER COUPON!

9" x 6 FT. 2 PIECE STEEL LOADING RAMPS
Haul Master
LOT NO. 44649/69591/69646

Item 44649 shown



SAVE 50%

1000 LB. CAPACITY

$39.99
REG. PRICE $79.99

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SUPER COUPON!

WIRELESS DRIVEWAY ALERT SYSTEM
LOT NO. 93068/69590
Bunker Hill Security



Item 93068 shown

SAVE 56%

$12.99
REG. PRICE $29.99

92078905

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SUPER COUPON!

LOT NO. 68050/60678
PITTSBURGH AUTOMOTIVE

RAPID PUMP® 2 TON LOW PROFILE LONG REACH HEAVY DUTY STEEL FLOOR JACK

SAVE $60

WEIGHS 102 LBS.



Item 68050 shown

$109.99
REG. PRICE $169.99

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SUPER COUPON!

SAVE $30

1.5 HP ELECTRIC POLE SAW
CHICAGO ELECTRIC POWER TOOLS OUTDOOR
LOT NO. 68862



$69.99
REG. PRICE $99.99

52621468

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SUPER COUPON!

3-IN-1 JUMP STARTER AND POWER SUPPLY
CEN-TECH
LOT NO. 38391/60657
900 PEAK AMPS



SAVE 36%

Item 60657 shown

$37.99
REG. PRICE $59.99

72545192

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Picture Perfect

National Geographic asked luminaries across genres—politics, film, and writing—to share with us the photographs that mean the most to them.



KEN BURNS, Documentarian Jerry Liebling was my mentor. He taught me how to see. His photograph "Boy and Car, New York City, 1949" abides with me. It is so simple and straightforward. Even when I close my eyes, especially when I close my eyes, I can see it: the boy's direct and revealing face, his improbable hockey shirt, his flapping old shoes, his irrepressible hat, the swoop of the car fender, the unmistakable honesty of the exchange between subject and artist, the subtle subtexts of race and money and power, all carefully balanced. Take a look at it again. It will reward another inspection.



MICHELLE OBAMA, U.S. First Lady Meeting Nelson Mandela in 2011 was such an honor—when I met him, I just kept saying, "Thank you, thank you, thank you." It also meant so much to me that my daughters were able to meet him. We encourage the girls to give back and engage, and meeting such an exemplary model of service and bravery was a life-changing experience for all of us.

PHOTOS: JEROME LIEBLING (TOP); OFFICIAL WHITE HOUSE PHOTO BY SAMANTHA APPLETON

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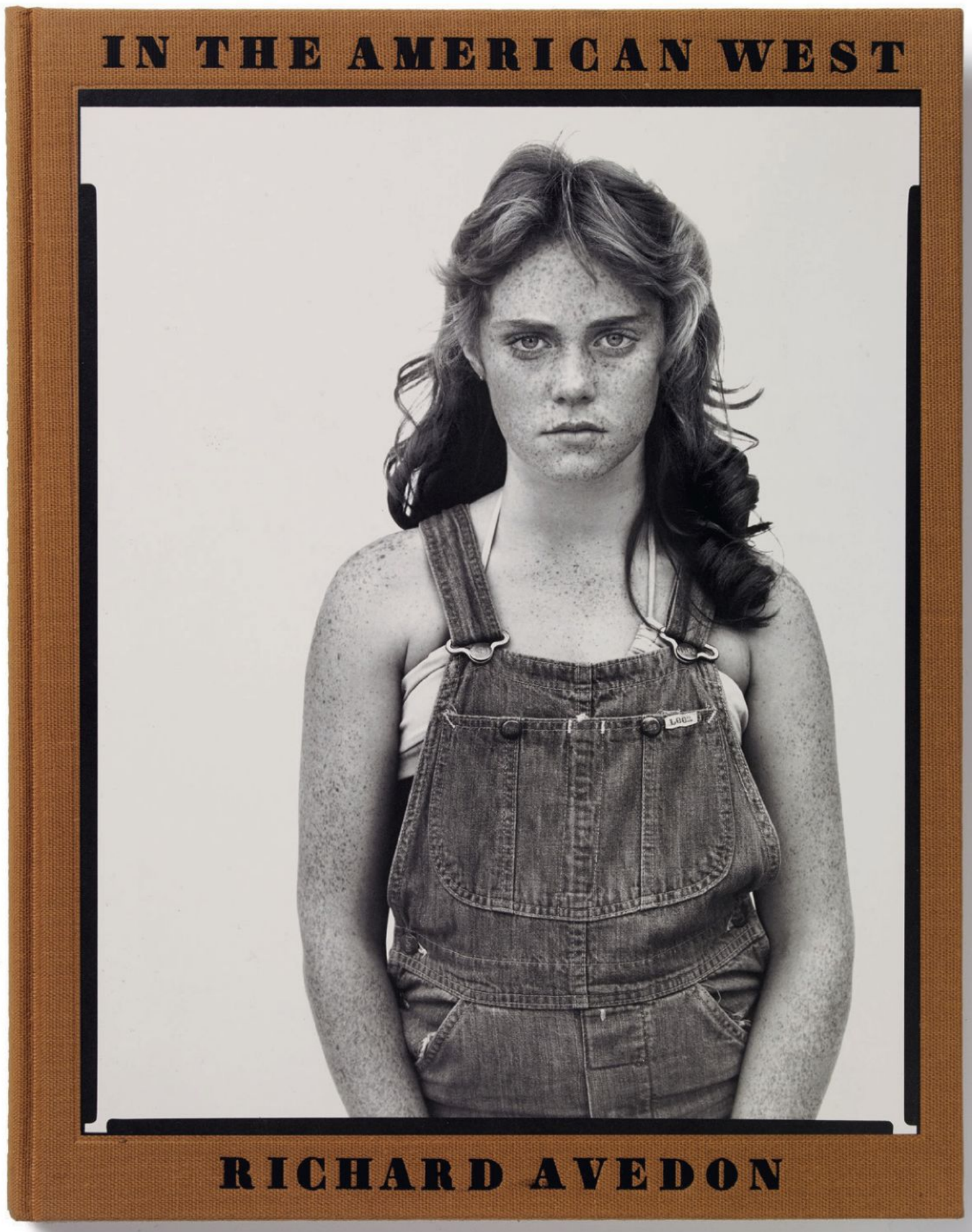
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LARRY MCMURTRY, Writer
I have a favorite book of photographs: Richard Avedon's *In the American West.* It is a brilliant grouping that explodes the complacent pastoralism that dominated photography of the West from the beginning, the most famous example of which is Ansel Adams's "Moonrise, Hernandez, New Mexico." It is a fine photograph, of course, but what Avedon has done is show us the people who live beneath such a moon.

JEFF BRIDGES, Actor
Here's one of Jacques Henri Lartigue's (below). His photographs have a capricious quality that captures his life and times so brilliantly—sublime snapshots.



PHOTOS: *IN THE AMERICAN WEST,* PUBLISHED BY ABRAMS BOOKS, 1985 © THE RICHARD AVEDON FOUNDATION, USED BY PERMISSION (TOP); JACQUES HENRI LARTIGUE © MINISTÈRE DE LA CULTURE—FRANCE/AAJHL



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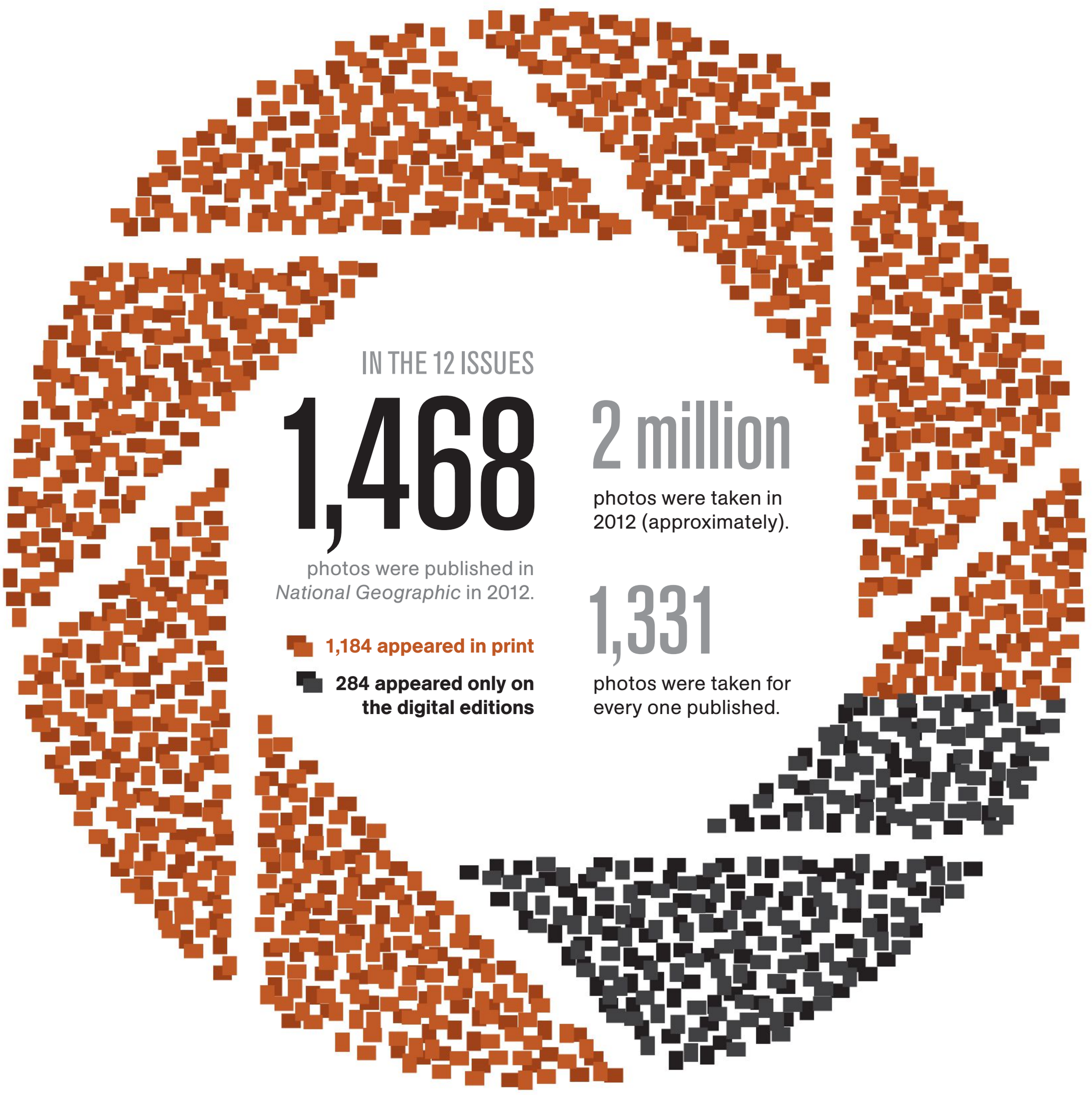
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YEAR TOTALS

A year by the numbers

Every photo counts at *National Geographic*—so we counted every photo taken for the magazine last year, published or not. We also dived into our photographic division's travel records to see who went where during 2012.



PHOTOGRAPHERS WORKING ON ASSIGNMENT DURING 2012

62

COUNTRIES VISITED BY THOSE PHOTOGRAPHERS FOR ASSIGNMENTS

54

Places visited include Afghanistan, Albania, Antarctica, Australia, Bahamas, Brazil, Cambodia, Cameroon, Canada, Chile, China, Costa Rica, Cuba, Cyprus, Democratic Republic of the Congo, Ecuador, Egypt, Ethiopia, Gaza Strip, Georgia, Germany, Guatemala, India, Indonesia, Iraq, Israel, Italy, Japan, Jordan, Kuwait, Laos, Libya, Mexico, Mozambique, Namibia, Nepal, Netherlands, Norway, Oman, Papua New Guinea, Peru, Philippines, Portugal, Qatar, Romania, Russia, South Africa, Spain, Suriname, Syria, Tanzania, Thailand, United Arab Emirates, United Kingdom, United States, and Yemen.

GRAPHIC: ÁLVARO VALIÑO

"HAVING LESS **DIABETIC NERVE PAIN...** IT'S A WONDERFUL FEELING."

—PHYLLIS, RETIRED SCHOOL BUS DRIVER
DIAGNOSED WITH DIABETIC NERVE PAIN.



Diabetes damages nerves which may cause pain.



Lyrica is FDA approved to treat Diabetic Nerve Pain.

Artist depiction

Get specific treatment for Diabetic Nerve Pain.

LYRICA®
PREGABALIN Ⓒ
capsules

Diabetic Nerve Pain (or pain from Diabetic Peripheral Neuropathy) is characterized by shooting, burning, pins and needles symptoms. **Lyrica provides effective pain relief so patients feel better.*** Some patients also had a significant reduction of pain in as early as one week. And, Lyrica is not a narcotic.**

Ask your doctor about Lyrica today.

*Individual results may vary. **Those who have had a drug or alcohol problem may be more likely to misuse Lyrica.
We asked Phyllis to tell us about her experience with Lyrica. To hear Phyllis's story visit Lyrica.com.

Prescription Lyrica is not for everyone. Tell your doctor right away about any serious allergic reaction that causes swelling of the face, mouth, lips, gums, tongue, throat, or neck or any trouble breathing, rash, hives or blisters. Lyrica may cause suicidal thoughts or actions in a very small number of people. Patients, family members or caregivers should call the doctor right away if they notice suicidal thoughts or actions, thoughts of self harm, or any unusual changes in mood or behavior. These changes may include new or worsening depression, anxiety, restlessness, trouble sleeping, panic attacks, anger, irritability, agitation, aggression, dangerous impulses or violence, or extreme increases in activity or talking. If you have suicidal thoughts or actions, do not stop Lyrica without first talking to your doctor. Lyrica may cause swelling of your hands, legs and feet. Some of the most common side effects of Lyrica are dizziness and sleepiness. Do not drive or work with machines until you know how Lyrica affects you. Other common side effects are blurry vision, weight gain, trouble concentrating, dry mouth, and feeling "high." Also, tell your doctor right away about muscle pain along with feeling sick and feverish, or any changes in your eyesight including blurry vision or any skin sores if you have diabetes. You may have a higher chance of swelling, hives or gaining weight if you are also taking certain diabetes or high blood pressure medicines. Do not drink alcohol while taking Lyrica. You may have more dizziness and sleepiness if you take Lyrica with alcohol, narcotic pain medicines, or medicines for anxiety. If you have had a drug or alcohol problem, you may be more likely to misuse Lyrica. Tell your doctor if you are planning to father a child. Talk with your doctor before you stop taking Lyrica or any other prescription medication.

Please see Important Risk Information for Lyrica on the following page.

To learn more visit www.lyrica.com or call toll-free 1-888-9-LYRICA (1-888-959-7422).

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.FDA.gov/medwatch or call 1-800-FDA-1088.

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IMPORTANT FACTS

LYRICA® PREGABALIN Ⓒ capsules

(**LEER**-i-kah)

IMPORTANT SAFETY INFORMATION ABOUT LYRICA

LYRICA may cause serious, even life threatening, allergic reactions.
Stop taking LYRICA and call your doctor right away if you have any signs of a serious allergic reaction:
- Swelling of your face, mouth, lips, gums, tongue, throat or neck
- Have any trouble breathing
- Rash, hives (raised bumps) or blisters

Like other antiepileptic drugs, LYRICA may cause suicidal thoughts or actions in a very small number of people, about 1 in 500.
Call your doctor right away if you have any symptoms, especially if they are new, worse or worry you, including:
- suicidal thoughts or actions
- new or worse depression
- new or worse anxiety
- feeling agitated or restless
- panic attacks
- trouble sleeping
- new or worse irritability
- acting aggressive, being angry, or violent
- acting on dangerous impulses
- an extreme increase in activity and talking
- other unusual changes in behavior or mood

If you have suicidal thoughts or actions, do not stop LYRICA without first talking to your doctor.

LYRICA may cause swelling of your hands, legs and feet.
This swelling can be a serious problem with people with heart problems.

LYRICA may cause dizziness or sleepiness.
Do not drive a car, work with machines, or do other dangerous things until you know how LYRICA affects you. Ask your doctor when it is okay to do these things.

ABOUT LYRICA

LYRICA is a prescription medicine used in adults 18 years and older to treat:
- Pain from damaged nerves that happens with diabetes or that follows healing of shingles, or spinal cord injury
- Partial seizures when taken together with other seizure medicines
- Fibromyalgia (pain all over your body)

Who should NOT take LYRICA:
- Anyone who is allergic to anything in LYRICA

BEFORE STARTING LYRICA

Tell your doctor about all your medical conditions, including if you:
- Have had depression, mood problems or suicidal thoughts or behavior
- Have or had kidney problems or dialysis
- Have heart problems, including heart failure
- Have a bleeding problem or a low blood platelet count
- Have abused prescription medicines, street drugs or alcohol in the past
- Have ever had swelling of your face, mouth, tongue, lips, gums, neck, or throat (angioedema)
- Plan to father a child. It is not known if problems seen in animal studies can happen in humans.
- Are pregnant, plan to become pregnant or are breastfeeding. It is not known if LYRICA will harm your unborn baby. You and your doctor should decide whether you should take LYRICA or breast-feed, but you should not do both.

Tell your doctor about all your medicines. Include over-the-counter medicines, vitamins, and herbal supplements. LYRICA and other medicines may affect each other causing side effects. Especially tell your doctor if you take:

BEFORE STARTING LYRICA, continued

- Angiotensin converting enzyme (ACE) inhibitors. You may have a higher chance for swelling and hives.
- Avandia® (rosiglitazone)*, Avandamet® (rosiglitazone and metformin)* or Actos® (pioglitazone)** for diabetes. You may have a higher chance of weight gain or swelling of your hands or feet.
- Narcotic pain medicines (such as oxycodone), tranquilizers or medicines for anxiety (such as lorazepam). You may have a higher chance for dizziness and sleepiness.
- Any medicines that make you sleepy.

POSSIBLE SIDE EFFECTS OF LYRICA

LYRICA may cause serious side effects, including:
- See "Important Safety Information About LYRICA."
- Muscle problems, pain, soreness or weakness along with feeling sick and fever
- Eyesight problems including blurry vision
- Weight gain. Weight gain may affect control of diabetes and can be serious for people with heart problems.
- Feeling "high"

If you have any of these symptoms, tell your doctor right away.

The most common side effects of LYRICA are:
- Dizziness
- Blurry vision
- Weight gain
- Sleepiness
- Trouble concentrating
- Swelling of hands and feet
- Dry mouth

If you have diabetes, you should pay extra attention to your skin while taking LYRICA.

HOW TO TAKE LYRICA

Do:
- Take LYRICA exactly as your doctor tells you. Your doctor will tell you how much to take and when to take it. Take LYRICA at the same times each day.
- Take LYRICA with or without food.

Don't:
- Drive a car or use machines if you feel dizzy or sleepy while taking LYRICA.
- Drink alcohol or use other medicines that make you sleepy while taking LYRICA.
- Change the dose or stop LYRICA suddenly. If you stop taking LYRICA suddenly, you may have headaches, nausea, diarrhea, trouble sleeping, increased sweating, or you may feel anxious. If you have epilepsy, you may have seizures more often.
- Start any new medicines without first talking to your doctor.

NEED MORE INFORMATION?

- Ask your doctor or pharmacist. This is only a brief summary of important information.
- Go to **www.lyrica.com** or call **1-866-459-7422 (1-866-4LYRICA).**

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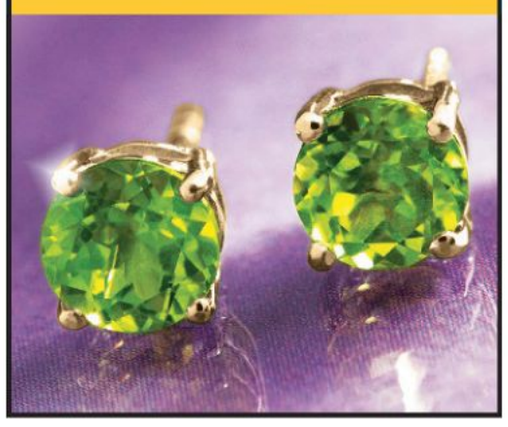
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Meet the Beauty in the Beast

Discover this spectacular 6½-carat green treasure from Mount St. Helens!

For almost a hundred years it lay dormant. Silently building strength. At 10,000 feet high, it was truly a sleeping giant. Until May 18, 1980, when the beast awoke with violent force and revealed its greatest secret. Mount St. Helens erupted, sending up a 80,000-foot column of ash and smoke. From that chaos, something beautiful emerged… our spectacular ***Helenite Necklace***.

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with purchase of Helenite Necklace



Helenite is produced from the heated volcanic rock of Mount St. Helens and the brilliant green creation has captured the eye of jewelry designers world-wide. Today you can wear this massive 6½-carat stunner for ***only $149***!

Make your emeralds jealous. Our ***Helenite Necklace*** puts the green stone center stage, with a faceted pear-cut set in .925 sterling silver finished in luxurious gold. The explosive origins of the stone are echoed in the flashes of light that radiate as the piece swings gracefully from its 18" luxurious gold-finished sterling silver chain. Today the volcano sits quiet, but this unique piece of American natural history continues to erupt with gorgeous green fire.



Necklace enlarged to show luxurious color.

Your satisfaction is guaranteed. Bring home the ***Helenite Necklace*** and see for yourself. If you are not completely blown away by the rare beauty of this exceptional stone, simply return the necklace within 30 days for a full refund of your purchase price.

JEWELRY SPECS:

- 6 ½ ctw Helenite in gold-finished sterling silver setting
- 18" gold-finished sterling silver chain

Limited to the first 2200 orders from this ad only

Helenite Necklace (6 ½ ctw).....*Only* **$149** +S&P
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Stauer Client

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CAREER TOTALS

15 photographers, 8 questions

We asked 15 *National Geographic* photographers (named below) a few questions about their careers—and all of the travel that makes those careers possible.

How many stories have you shot for *National Geographic*? ▪ How many countries have you visited during your career? ▪ What was your longest assignment ever? ▪ How many cameras do you own? ▪ What nonphotographic item do you always take when you travel? ▪ What's the first thing you do when you get home? ▪ How old were you when you decided to be a photographer? ▪ What is the heaviest baggage you ever checked?

375+

STORIES HAVE BEEN SHOT BY THE FOLLOWING PHOTOGRAPHERS.

William Albert Allard
Robert Clark
Jodi Cobb
Kenneth Garrett
David Alan Harvey
Tim Laman
Erika Larsen
Steve McCurry
Michael "Nick" Nichols
Paul Nicklen
Carsten Peter
Brian Skerry
John Stanmeyer
George Steinmetz
Mark Thiessen

58

AVERAGE NUMBER OF COUNTRIES VISITED ON ASSIGNMENT

Fourteen

AVERAGE NUMBER OF CAMERAS OWNED BY EACH OF THESE PHOTOGRAPHERS



Carsten Peter owns more than 50 cameras.

1/3

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BRIAN SKERRY, UNDERWATER PHOTOGRAPHER, CHECKED THE HEAVIEST BAGGAGE. (IT INCLUDED A 1,200-POUND REMOTELY OPERATED VEHICLE.)

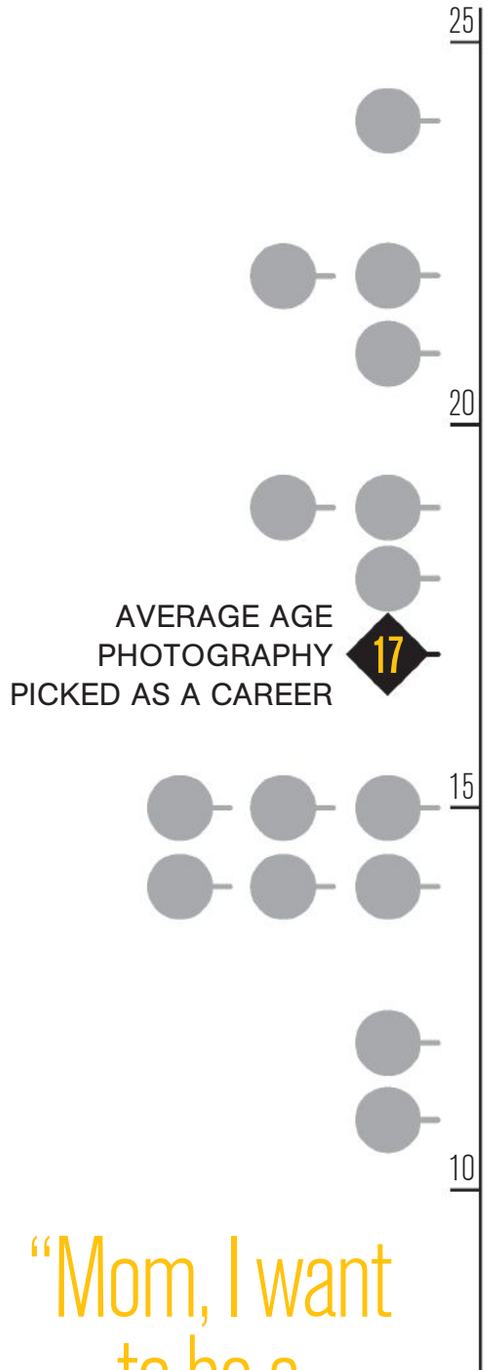
15 MONTHS

Tim Laman spent the longest continuous time on a single assignment—his birds of paradise story published in December 2012.



The first thing five photographers did when home from traveling:

KISS OR HUG FAMILY

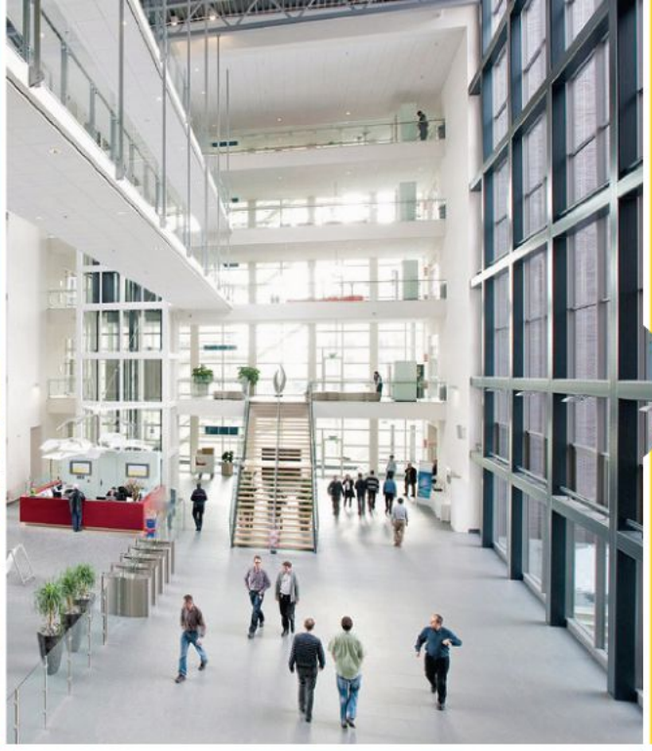


"Mom, I want to be a photographer."

Many photographers decided to pursue careers behind the camera while still in their teens.

GRAPHIC: ÁLVARO VALIÑO. PORTRAITS: MATTHEW TWOMBLY, NGM STAFF





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The Great Energy Challenge

is a National Geographic initiative in partnership with Shell that convenes and engages influential citizens and key energy stakeholders in solutions-based thinking and dialogue about our shared energy future.

It's a call-to-action to become actively involved, to learn more and do more—to change how we think about and consume energy so that we can all help tackle the big energy questions. Let's start now.

Be part of the solution.
Take part in the challenge.



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Interact with academics, engineers, think tank leaders, National Geographic contributors, and other insiders who are deeply engaged in the world's shared energy and climate challenges.

Join the debate and move the conversation forward

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Focused on the future of fuel and power, The Big Energy Question series aims to move the discussion of key energy issues from the theoretical to the practical. Bringing together prominent experts who have the power to impact change, The Big Energy Question tackles key subjects like advanced biofuels, natural gas, sustainable cities, and more through live and online discussion.

Test Your Energy I.Q.

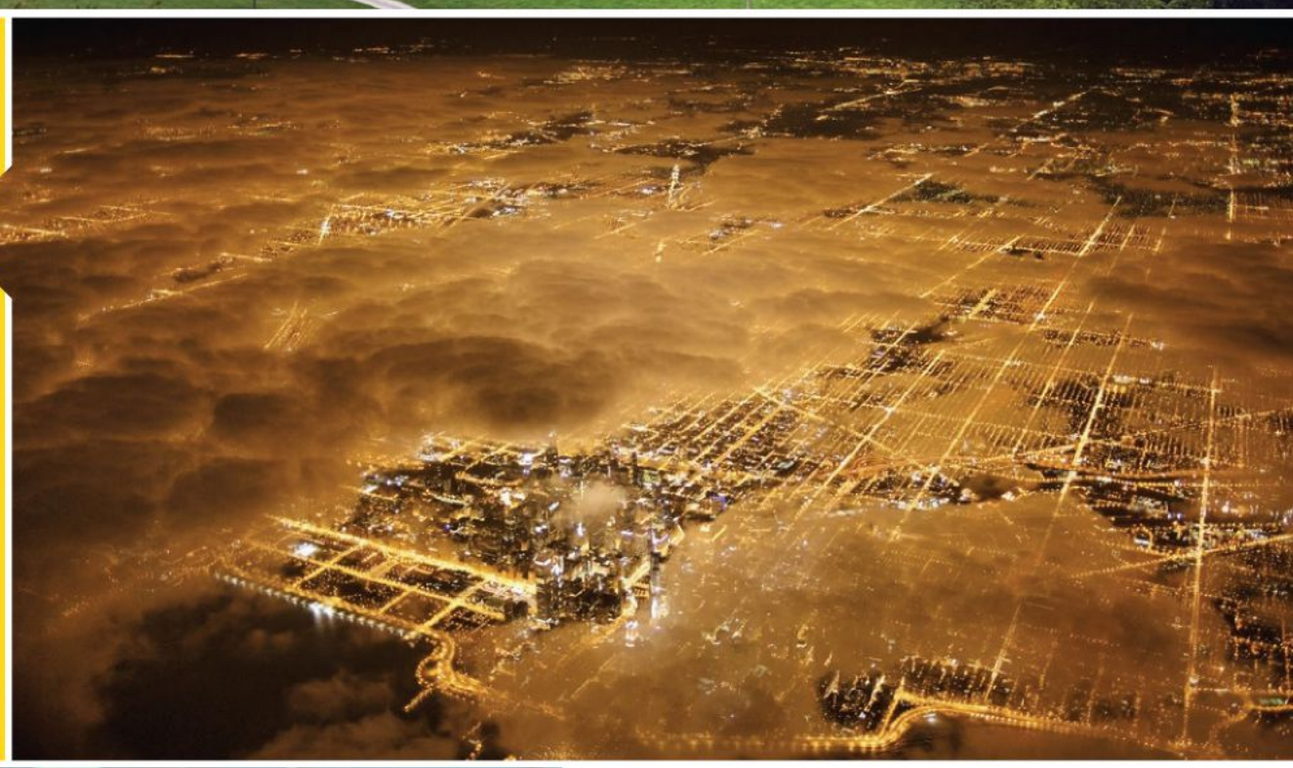
ENERGY QUIZZES ▸ Featuring amazing facts and energy-saving tips.

Energy Quizzes cover subjects that affect us all, such as Food, Cars, Biofuels, and Cities. You can find out what nation leads in ethanol production, how drivers can reduce fuel use, how cities keep warm through urban planning, how many people still use wood for cooking, and the symbiotic relationship between energy, water, and food production.



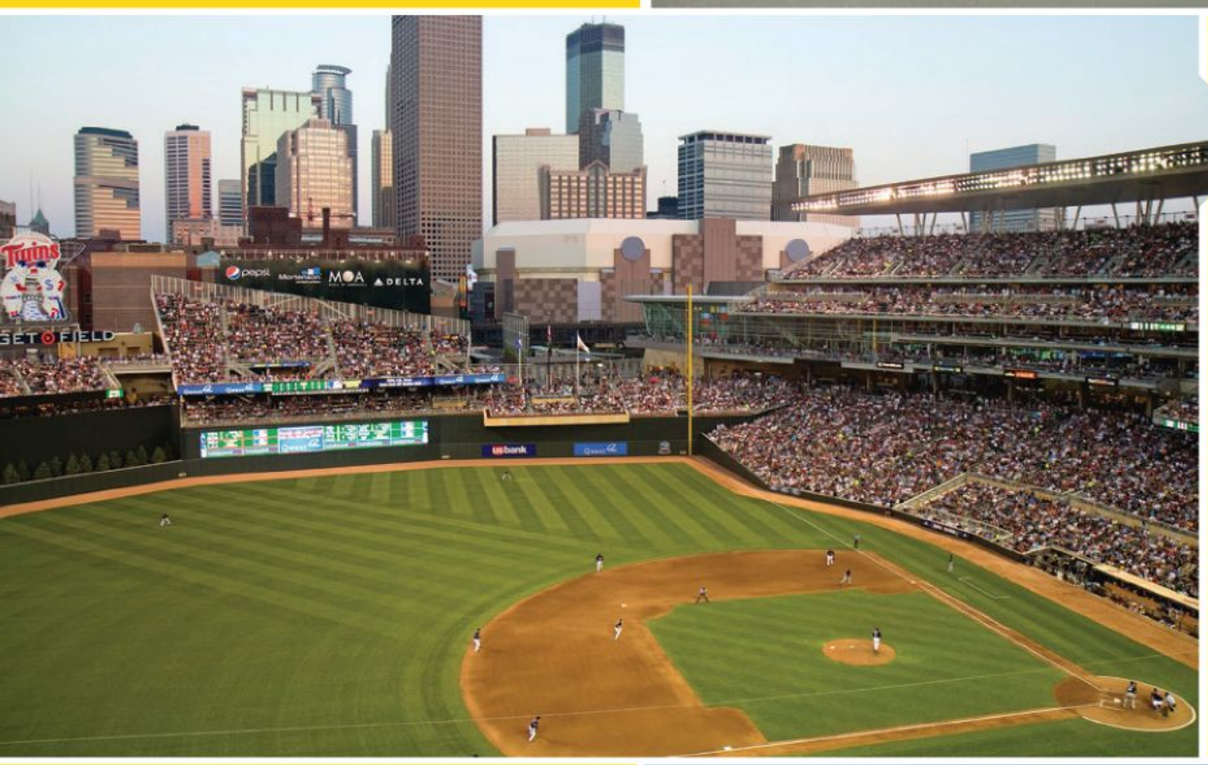


What are the breakthroughs and new technologies that will enter the energy mix?

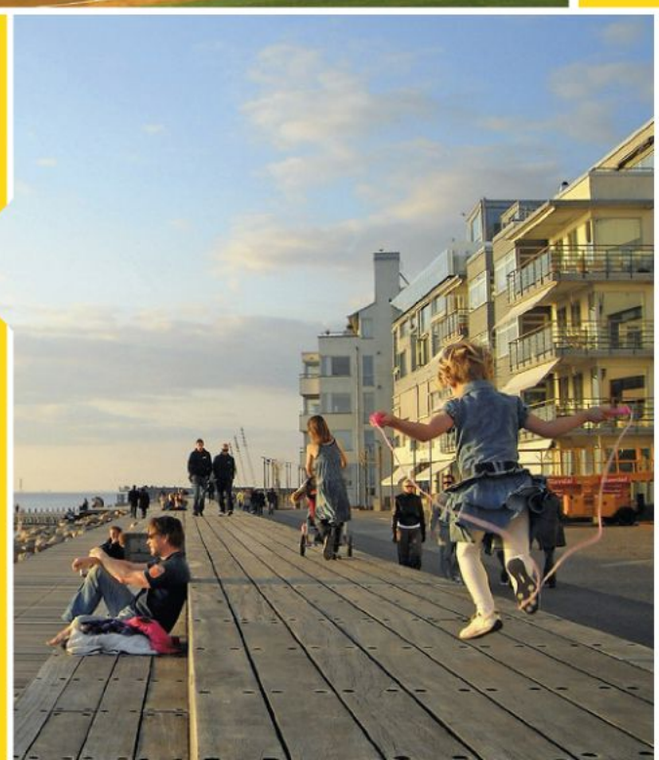


How will we drive change for smarter mobility?





As we move to a population of 9 billion by mid-century, how do we manage the stress on the intersection of food, water, and energy?



Do rapidly growing cities offer a blueprint for energy sustainability?

PHOTOS (from top left):

The new aerial tramway in Medellín, Colombia, won a Sustainable Transport Award from the Institute for Transportation and Development Policy. Photo by Kike Calvo, National Geographic

A natural gas derrick rises from the countryside in rural southwestern Pennsylvania. Photo by Scott Goldsmith, National Geographic

Chicago at night burns bright under blankets of clouds. Photo by Jim Richardson, National Geographic

In Kristianstad, Sweden, biogas is used to fuel cars and municipal garbage trucks and buses. Photo by Mark Thiessen, National Geographic

The Minnesota Twins' Target Field was the second U.S. ballpark ever to become LEED-certified, and it is the only ballpark with LEED certifications in both construction and operations.

With a smart heating and cooling system and renewable energy, the Western Harbor, in Malmö, Sweden, established itself as the first carbon-neutral neighborhood in Europe. Photo by Heureux/Flickr

Everything you need to stay current on the big picture of energy— and what it means for you—can be found at

greatenergychallenge.com

NATIONAL GEOGRAPHIC

A NATIONAL GEOGRAPHIC INITIATIVE IN PARTNERSHIP WITH SHELL

The Great Energy Challenge

A world of innovation: energy ideas around the globe.

The Great Energy Challenge has awarded sixteen grants to support projects that focus on innovative energy solutions and shared their stories to help bring them to life.

A Message From Shell

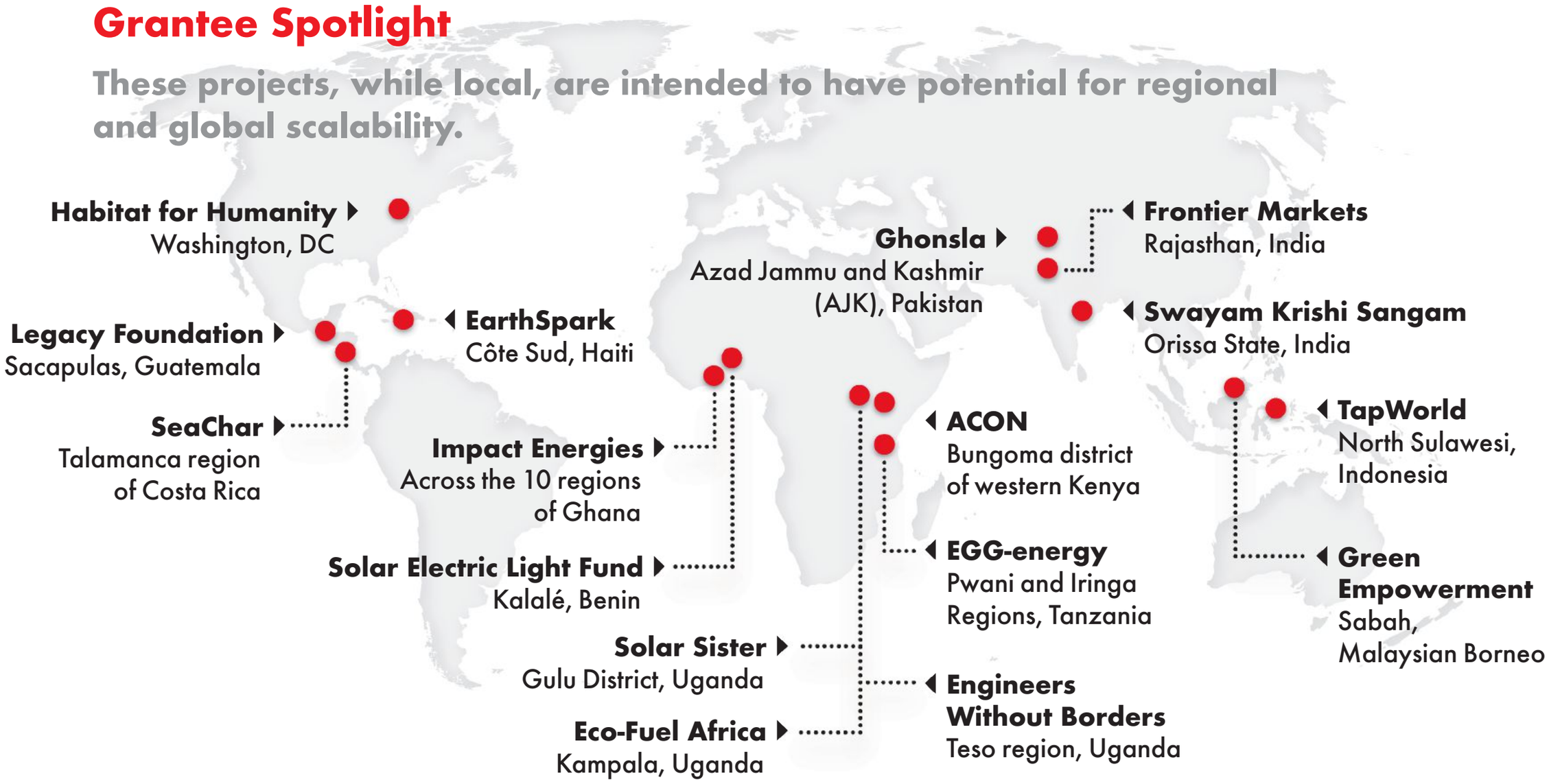
"Energy is vital to our daily lives. To meet the surging demand and transform our energy system to one that is cleaner and more sustainable will require a new level of collaboration. That's why Shell is partnering with National Geographic in The Great Energy Challenge. We invite you to join us as we explore innovative and responsible ways to meet the energy demands of the future. Together, we can make a lasting impact."



PETER VOSER
CEO,
Royal Dutch Shell

Grantee Spotlight

These projects, while local, are intended to have potential for regional and global scalability.



The Great Energy Challenge Advisory Team

Meet the distinguished panel of advisors who help identify and evaluate projects for Great Energy Challenge grants.

Thomas E. Lovejoy, Advisory Team Chair, is a conservation fellow at the National Geographic Society and chairman of the Energy Advisory Committee. He is known for his work on biodiversity, and his innovations include the concept of debt-for-nature swaps and the public television series *Nature*.

Sally M. Benson, a leading expert in low-carbon energy supply, directs the Global Climate and Energy Project at Stanford University. She is a research professor in the Department of Energy Resources Engineering in the School of Earth Sciences.

José Goldemberg, the former environment minister in Brazil, helped guide that country's effort to replace much of its oil consumption with sugarcane ethanol. He is a professor at the University of São Paulo.

Daniel Kammen is a Class of 1935 Distinguished Professor of Energy at the University of California, Berkeley. Dan is also founding director of the Renewable and Appropriate Energy Laboratory and co-director of the Berkeley Institute of the Environment.

Amory Lovins co-founded and chairs the Rocky Mountain Institute—an independent, entrepreneurial, nonprofit "think-and-do tank" that drives the efficient and restorative use of resources.

Rajendra K. Pachauri chairs the Nobel Prize–winning Intergovernmental Panel on Climate Change. He is director-general of The Energy and Resources Institute (TERI), renowned for its work in energy, the environment, forestry, biotechnology, and conservation.

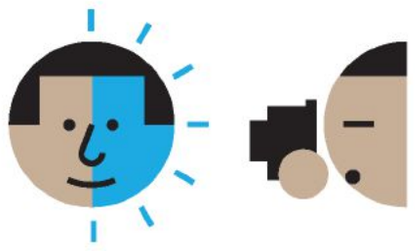
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Portraits of the left side of people's faces are perceived as more aesthetically pleasing than those of the right.





Old Yet New

Photographer Ian Ruhter ditched his digital camera three years ago when he discovered the 19th-century photography of Eadweard Muybridge. Ruhter—who once covered action sports—was first drawn to Muybridge's stop-motion frames but was ultimately hooked by the hands-on technique used to create them.

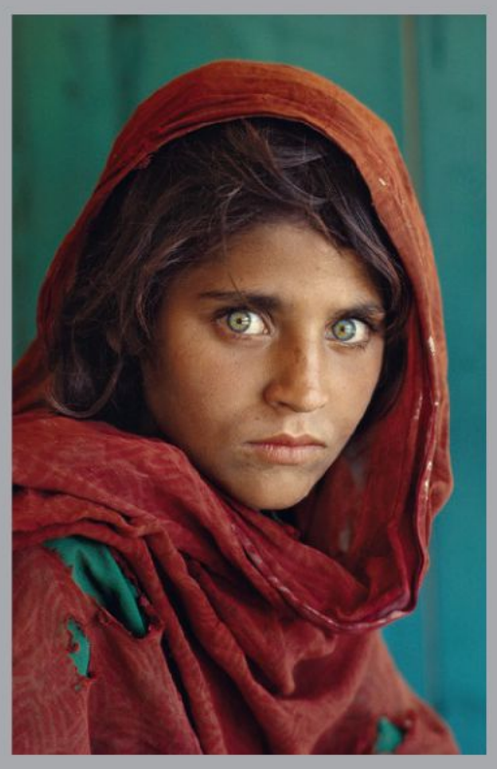
Known as wet-plate collodion, the process involves pouring a liquid mixture of iodides, bromides, and a solution called collodion over a glass or aluminum plate, which is then bathed in silver nitrate to make it light sensitive. The plate must be exposed and developed quickly, before the collodion dries and loses sensitivity.

Ruhter's images (like this one, left, of skateboarder Levi Brown) benefit from modern studio lighting. Still, for him, making wet plates is about embracing the past. The old-school art form is catching on with others too, he says: "I definitely think it's making a comeback." *—Catherine Zuckerman*

ANSWERS FOR EXPLORERS QUIZ

1. (A) On a website. Malaysian photographer Hock Ping Guek made his macro image of an elusive lacewing at a park near Kuala Lumpur and posted it on the Flickr website. California entomologist Shaun Winterton spotted it soon after and emailed Guek to alert him that it might be a new species. It took a year, but Guek eventually captured the lacewing. In 2012 he and Winterton, together with a third scientist, published the discovery. The lacewing is named *Semachrysa jade* after Winterton's daughter.
2. (C) A running horse. Rail magnate and former California governor Leland Stanford first hired Muybridge to prove that at some point in a horse's gait, all four hooves are off the ground together. Muybridge answered the question with a photo showing Stanford's own trotting horse airborne. Muybridge's subsequent stop-motion sequences of animal and human locomotion have influenced artists from painter Thomas Eakins to the rock group U2.
3. (B) The electron microscope. Because these microscopes make pictures using electron wavelengths rather than visible light, they can produce images at more than 100,000 times the magnification of even the most sophisticated conventional camera. Electron microscopes have opened up the structure and organization of the cell, produced the first images of viruses, and provided critical information on emerging diseases.
4. (B) A physics-themed, all-female rock group. Staff and significant others at the European Organization for Nuclear Research (CERN) formed Les Horribles Cernettes and performed at CERN's annual Hardronic music festival. Tim Berners-Lee was working at CERN then to create the World Wide Web and wanted a photo to show that the Web could be more than just physics. A 1992 shot of the Cernettes seemed perfect. Berners-Lee has since become Sir Tim for his achievements. The Cernettes still perform, and there are now tens of billions of photos on the Web.
5. (D) Ansel Adams. His luminous landscapes, and personal lobbying, helped inspire the modern environmental movement. President Franklin D. Roosevelt was so taken with Adams's 1938 book of photographs, *Sierra Nevada: The John Muir Trail,* that he helped push through the creation of Kings Canyon National Park. Adams's photo "The Tetons and the Snake River," taken in 1942, is one of 115 images aboard the Voyager 1 space probe, launched in 1977 and now some 12 billion miles from Earth.
6. (A) DNA's double helix. Rosalind Franklin began photographing DNA using x-ray crystallography in 1951. Her "Photograph 51" and the accompanying data—which had been passed along without her permission—helped James Watson and Francis Crick accurately decode DNA's double helix for the first time. The two men shared the 1962 Nobel Prize for this discovery. Franklin had died of ovarian cancer, at age 37, in 1958.

PHOTO: IAN RUHTER. GRAPHIC: ÁLVARO VALIÑO. SOURCE: DEPARTMENT OF PSYCHOLOGY, WAKE FOREST UNIVERSITY



THE POWER OF PHOTOGRAPHY

Photographers use their cameras as tools of exploration, passports to inner sanctums, instruments for change. Their images are proof that photography matters—now more than ever.



































IMAGE CREDITS: **NGM.COM/PHOTOISSUE**

By Robert Draper

Thirty-four years before the birth of this magazine, the Danish philosopher Søren Kierkegaard sourly prophesied a banal fate for the newly popularized art of photography. "With the daguerreotype," he observed, "everyone will be able to have their portrait taken—formerly it was only the prominent—and at the same time everything is being done to make us all look exactly the same, so we shall only need one portrait."

The National Geographic Society did not set out to test Kierkegaard's thesis, at least not right away. Its mission was exploration, and the gray pages of its official journal did not exactly constitute a visual orgy. Years would go by before *National Geographic*'s explorers would begin using the camera as a tool to bring back what is now its chief source of fame: photographic stories that can alter perceptions and, at their best, change lives.

By wresting a precious particle of the world from time and space and holding it absolutely still, a great photograph can explode the totality of our world, such that we never see it quite the same again. After all, as Kierkegaard also wrote, "the truth is a snare: you cannot have it, without being caught."

Today photography has become a global cacophony of freeze-frames. Millions of pictures are uploaded every minute. Correspondingly, everyone is a subject, and knows it—any day now we will be adding the unguarded moment to the endangered species list. It's on this hyper-egalitarian, quasi-Orwellian, all-too-camera-ready "terra infirma" that *National Geographic*'s photographers continue to stand out. Why they do so is only partly explained by the innately personal choices (which lens for which lighting for which moment) that help define a photographer's style. Instead, the very best of their images remind us that a photograph has the power to do infinitely more than document. It can transport us to unseen worlds.

When I tell people that I work for this magazine, I see their eyes grow wide, and I know what will happen when I add, as I must: "Sorry, I'm just one of the writers." A *National Geographic* photographer is the personification of worldliness, the witness to all earthly beauty, the occupant of everybody's dream job. I've seen *The Bridges of Madison County*—I get it, I'm not bitter. But I have also frequently been thrown into the company of a *National Geographic* photographer at work, and what I have seen is everything to admire and nothing whatsoever to envy. If what propels them is ferocious determination to tell a story through transcendent images, what encumbers their quest is a daily litany of obstruction (excess baggage fees, inhospitable weather, a Greek chorus of "no"), interrupted now and then by disaster (broken bones, malaria, imprisonment). Away from home for many months at a time—missing birthdays, holidays, school plays—they can find themselves serving as unwelcome ambassadors in countries hostile to the West. Or sitting in a tree for a week. Or eating bugs for dinner. I might add that Einstein, who snarkily referred to photographers as *lichtaffen,* meaning "monkeys drawn to light," did not live by 3 a.m. wake-up calls. Let's not confuse nobility with glamour. What transfixes me, almost as much as their images, is my colleagues' cheerful capacity for misery.

Apparently they wouldn't have it any other way. The lodestone of the camera tugged at each of them from their disparate origins (a small town in Indiana or Azerbaijan, a polio isolation ward, the South African military), and over time their work would reflect differentiated passions: human conflict and vanishing cultures, big cats and tiny insects, the desert and the sea. What do the *National Geographic* photographers share? A hunger for the unknown, the courage to be ignorant, and the wisdom to recognize that, as one says, "the

Robert Draper is a contributing writer.

photograph is never taken—it is always given."

In the field I've seen some of my lens-toting compatriots sit for days, even weeks, with their subjects, just listening to them, learning what it is they have to teach the world, before at last lifting the camera to the eye. Our photographers have spent literally years immersed in the sequestered worlds of Sami reindeer herders, Japanese geisha, and New Guinea birds of paradise. The fruit of that commitment can be seen in their photographs. What's not visible is their sense of responsibility toward those who dared to trust the stranger by opening the door to their quiet world. It's a far riskier and time-consuming proposition to forgo the manipulated shot and instead view photography as a collaborative venture between two souls on either side of the lens.

Conscience is the other trait that binds these photographers. To experience the beauty of harp seals swimming in the Gulf of St. Lawrence is also to see the frailty of their habitat: scores of seal pups drowning due to the collapse of ice floes, a direct consequence of climate change. To witness the calamity of war in the gold-mining region of the Democratic Republic of the Congo is also to envision a glimmer of hope: Show the gold merchants in Switzerland what their profiteering has wrought, and maybe they'll cease their purchases.

In the past 125 years, it turns out, Kierkegaard has been proved both wrong and right about photography. The images in *National Geographic* have revealed a world not of sameness but of wondrous diversity. But they have also, increasingly, documented societies and species and landscapes threatened by our urge for homogenization. The magazine's latter-day explorers are often tasked with photographing places and creatures that a generation later may live only in these pages. How do you walk away from that? If my colleagues suffer a shared addiction, it's to using the formidable reach and influence of this iconic magazine to help save the planet. Does that sound vainglorious? Ask the Swiss gold merchants. They saw Marcus Bleasdale's images at a Geneva exhibit, and their Congolese gold purchases halted almost overnight.

Of course, every professional photographer hopes for The Epic Shot, the once-in-a-lifetime collision of opportunity and skill that gains a photograph instant entry into the pantheon alongside Joe Rosenthal's Iwo Jima, Bob Jackson's encounter with Jack Ruby gunning down Lee Harvey Oswald, and the Apollo 8 astronauts' color depictions of planet Earth in its beaming entirety. And yet, game-changing photographs are not what *National Geographic* photographers do. The most iconic photograph ever to grace these pages is not of anyone or anything historic. Rather, it's of Sharbat Gula, an Afghan girl of maybe 12 when photographer Steve McCurry encountered her in 1984 at a refugee camp in Pakistan. What her intense, sea-green eyes told the world from the cover of *National Geographic*'s June 1985 issue a thousand diplomats and relief workers could not. The Afghan girl's stare drilled into our collective subconscious and stopped a heedless Western world dead in its tracks. Here was the snare of truth. We knew her instantly, and we could no longer avoid caring.

A great photograph can explode the totality of our world, such that we never see it quite the same again.

McCurry shot his immortal portrait well before the proliferation of the Internet and the invention of the smartphone. In a world seemingly benumbed by a daily avalanche of images, could those eyes still cut through the clutter and tell us something urgent about ourselves and about the imperiled beauty of the world we inhabit? I think the question answers itself. ☐

Tune in to *National Geographic Photographers: The Best Job in the World* on the Channel this month.



Brent Stirton, Virunga National Park, Democratic Republic of the Congo, 2007 *This image of a dead gorilla being carried like royalty by grieving rangers and locals shocked the world when it was published: The 500-pound gorilla was one of six endangered mountain gorillas that were killed.*

witness





Photography is a weapon against what's wrong out there. It's bearing witness to the truth.

—Brent Stirton

Steve McCurry, Ahmadi oil field, Kuwait, 1991 *Under the black clouds of burning oil fields during the Gulf War, camels forage desperately for shrubs and water in southern Kuwait. Front-line photographs of regions ravaged by human strife can also illuminate war's environmental cost.*

Ed Kashi, Port Harcourt, Nigeria, 2007 *Amid toxic smoke from tire fires, Paulinous Uko carries a goat to slaughter in the oil-rich but impoverished Niger Delta. After the picture was published, an American woman and her fellow church members began paying for the boy to go to school.*

A child is put to work at a militia-run mine in Watsa.

[witness]

THE PRICE OF PRECIOUS

The minerals in our electronic devices
have bankrolled unspeakable violence in the Congo.



Desperate for safety, villagers flee fighting in the Ituri region of the Democratic Republic of the Congo.



Photographs by
Marcus Bleasdale

When I first went to the Congo, I realized that a hundred years after Joseph Conrad's Heart of Darkness, *nothing had changed. People were still being exploited, only now it was multinational corporations sucking up all the resources. A report in 2004 said that more than four million people had died in what is now called Africa's first world war, and I just couldn't believe that no one was talking about this horrific death toll. That enraged me. At one point I was spending eight months a year photographing this war, and yet only a couple of international reporters were covering it from Kinshasa. So I keep bringing back these images because I want to make people as angry as I am. I want them to know the minerals in our mobile phones or computers or cameras are funding violence. How can we make the horror stop? It begins with a photograph.*

A video interview with Marcus Bleasdale can be viewed on our digital editions.

By Jeffrey Gettleman

The first child soldier pops out of the bush clutching an AK-47 assault rifle in one hand and a handful of fresh marijuana buds in the other. The kid, probably 14 or 15, has this big, goofy, mischievous grin on his face, like he's just stolen something—which he probably has—and he's wearing a ladies' wig with fake braids dangling down to his shoulders. Within seconds his posse materializes from the thick, green leaves all around us, about ten other heavily armed youngsters dressed in ratty camouflage and filthy T-shirts, dropping down from the sides of the jungle and blocking the red dirt road in front of us. Our little Toyota truck is suddenly swarmed and immobilized by a four-and-a-half-foot-tall army.

This is on the road to Bavi, a rebel-controlled gold mine on the Democratic Republic of the Congo's wild eastern edge. Congo is sub-Saharan Africa's largest country and one of its richest on paper, with an embarrassment of diamonds, gold, cobalt, copper, tin, tantalum, you name it—trillions' worth of natural resources. But because of never ending war, it is one of the poorest and most traumatized nations in the world. It doesn't make any sense, until you understand that militia-controlled mines in eastern Congo have been feeding raw materials into the world's biggest electronics and jewelry companies and at the same time feeding chaos. Turns out your laptop—or camera or gaming system or gold necklace—may have a smidgen of Congo's pain somewhere in it.

Jeffrey Gettleman is the East Africa bureau chief for the New York Times. *See more images of the eastern Congo at* marcusbleasdale.com.

The mine in the Bavi area is a perfect example. It's controlled by a potbellied warlord called Cobra Matata, though "controlled" may be a strong word. There are no discernible front lines out here marking where government rule definitively ends and Cobra's territory definitively begins, no opposing troops hunkered down in trenches or foxholes eyeballing each other through their scopes. Instead there are just messy, blurry degrees of influence, often very marginal influence, with a few Congolese government guys lounging under a mango tree in one place, and maybe two miles down the road a few of Cobra's child soldiers smoking pot, and nothing in between but big, vacant, sparkling green wilderness.

"Sigara! Sigara!" the child soldiers yell, seeking cigarettes. Photographer Marcus Bleasdale and I quickly push fistfuls of Sportsmans, a local brand, out the window, and they are instantaneously gobbled up by feverish little hands. That seems to do the trick, along with a few thousand crumpled Congolese francs, worth less than five bucks, and then we're on our way again, rumbling down an excruciatingly bumpy dirt road, past thatched-roof villages and banana trees. In the distance giant mountains nose the sky.

When we get to Bavi, we sit down with the village elders and talk gold. The world gold price has quadrupled over the past ten years, but there's no sign of development or newfound prosperity out here. Bavi has the same broken-down feel of any other village in eastern Congo: a clump of round huts hunched by the road, a market where the shops are made of sticks, shopkeepers torpidly selling heaps of secondhand clothes, and glassy-eyed men reeking of home brew stumbling down the dirt footpaths. *(Continued on page 54)*

Schooled in conflict, child soldiers patrol the gold mine of Bavi in Orientale Province. They are controlled by warlord Cobra Matata, who trades minerals for guns.







Workers rip the earth apart in search of gold at the Sufferance mine in the Ituri region. Much of Congo's gold, more than $600 million worth a year, is smuggled across borders.



Gold is now the most lucrative of conflict minerals. Illicit profits from tin, tungsten, and tantalum have dropped 65 percent since 2010, when the campaign to link minerals with violence began gaining ground.



A boy waits his turn for spoonfuls of rice and beans in Pluto. In some areas of eastern Congo up to 40 percent of gold miners are children, often forcibly recruited by militias.



Heavy hearts attend the burial of eight-month-old Alexandrine Kabitsebangumi, who died of cholera at Kibati, a camp outside Goma that shelters people displaced by violence.

(Continued from page 41) There's no electricity or running water, and the elders say they need medicine and books for the school. The kids are barefoot, their bellies pushed out like balloons from malnutrition or worms or both.

"We're broke," says Juma Mafu, one of the elders. "We've got a lot of gold but no machines to get it out. Our diggers use their hands. No big companies are ever going to come here unless we have peace." Which they clearly don't.

The birds are chirping, and the afternoon sun is slanting behind us as we walk down the hill

The minister of mines shakes his fat head and says, "You're under arrest."

toward the gold mine. First stop is to say hello to the "minister of mines," who is at a pub in the market, sitting Buddha-like with his eyes half closed behind a forest of freshly polished-off Primus beer bottles. He is an enormous man and wears a cheap, silvery blazer stretched awkwardly over the thick rolls of fat on his back.

"Hujambo, mzee," I say, giving him a respectful Swahili greeting.

He burps—loudly. I tell him we're journalists and we'd like to see the gold mine.

He laughs a nasty little laugh and then says, "How do I know you're journalists? Maybe you're spies." The word "spies" shoots through the market like a spark, igniting a crowd of people, who suddenly flock around us. A one-eyed child soldier glares at us menacingly and fingers his gun. Another young man abruptly announces that he works for the Congolese government intelligence service and wants to see our documents.

Time to leave, I think. Time to leave, *right now.* As casually as I can manage at this point, though my voice is beginning to crack, I say, "Fine…uh…no problem. Then we'll just…um…go home."

But the minister of mines shakes his fat head. "No, no, you won't. You're under arrest."

"For what?" I ask, my throat parched.

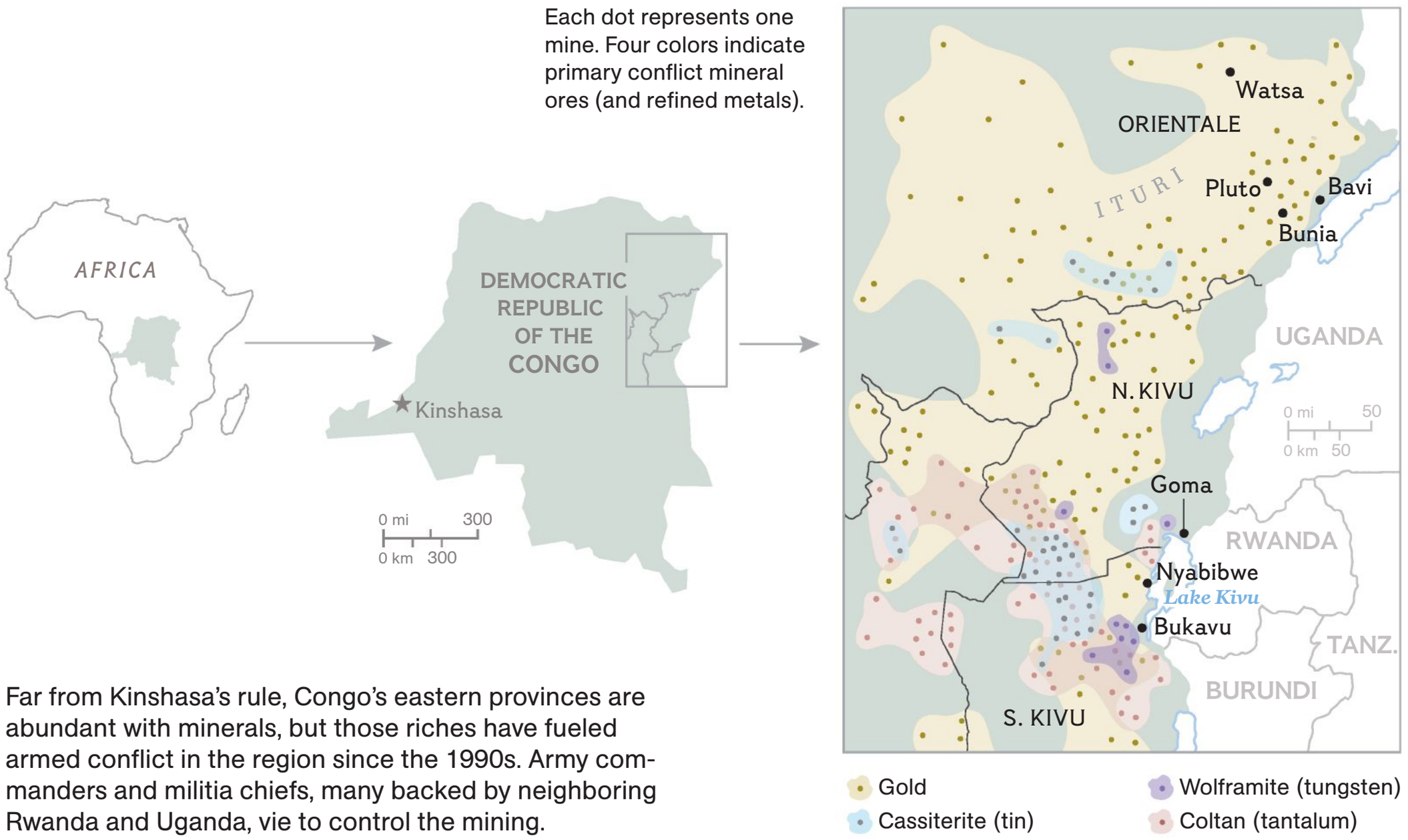
"For being in a *zone rouge*."

Isn't most of eastern Congo a red zone, controlled by armed groups? I think. But I don't say anything, because the next minute we're marched into a car for a five-hour drive to the larger town of Bunia, where we will be held at gunpoint and interrogated in a dark, little house with mysterious stains on the floor.

THE STORY OF CONGO is this: The government in Kinshasa, the capital, is weak and corrupt, leaving this vast nation rotten at its core. The remote east has plunged straight into anarchy, carved up by a hodgepodge of rebel groups that help bankroll their brutality with stolen minerals. The government army is often just as sticky fingered and wicked. Few people in recent memory have suffered as long, and on such a horrifying scale, as the Congolese. Where else are men, women, and children slaughtered by the hundreds, year after year, sometimes so deep in the jungle that it takes weeks for the truth to come out? Where else are hundreds of thousands of women raped and just about nobody punished?

To appreciate how Congo descended into this madness, you need to step back more than a hundred years to when King Leopold II of Belgium snatched this huge space in the middle of Africa as his own personal colony. Leopold wanted rubber and ivory, and he started the voracious wholesale assault on Congo's resources that has dragged on to this day. When the Belgians abruptly granted Congo independence in 1960, insurrections erupted immediately, paving the way for an ambitious young military man, Mobutu Sese Seko, to seize power—and never let go. Mobutu ruled for 32 years, stuffing himself with fresh Parisian cake airlifted into his jungle palaces while Congolese children curled up and starved.

But Mobutu would eventually go down, and when he did, Congo would go down with him. In 1994 Rwanda, next door, imploded in genocide, leaving up to a million dead. Many of the killers fled into eastern Congo, which became a base for destabilizing Rwanda. So Rwanda teamed up with neighboring Uganda and invaded Congo, ousting Mobutu in 1997 and installing their own proxy, Laurent Kabila. They soon grew annoyed



Far from Kinshasa's rule, Congo's eastern provinces are abundant with minerals, but those riches have fueled armed conflict in the region since the 1990s. Army commanders and militia chiefs, many backed by neighboring Rwanda and Uganda, vie to control the mining.

with him and invaded again. That second phase of Congo's war sucked in Chad, Namibia, Angola, Burundi, Sudan, and Zimbabwe—it's often called Africa's first world war.

In the ensuing free-for-all, foreign troops and rebel groups seized hundreds of mines. It was like giving an ATM card to a drugged-out kid with a gun. The rebels funded their brutality with diamonds, gold, tin, and tantalum, a hard, gray, corrosion-resistant element used to make electronics. Eastern Congo produces 20 to 50 percent of the world's tantalum.

Under intense international pressure in the early 2000s, the foreign armies officially withdrew, leaving Congo in ruins. Bridges, roads, houses, schools, and entire families had been destroyed. As many as five million Congolese had died. Peace conferences were hosted, but cordial meetings in fancy hotels didn't alter the ugly facts on the ground. The United Nations sent in thousands of military peacekeepers—there are around 17,000 today—but the blood continued to flow. Donor nations sank $500 million into an election in 2006—Congo's first truly inclusive one—but that didn't change things either.

Congo's east remained a battle zone. Ugandans, Rwandans, and Burundians kept sneaking across the borders to sponsor various rebel outfits, which kept using minerals to buy more weapons and pay more rebels, like the wig-wearing Cobra Matata boys. Despite the international outcry, no one knew exactly what to do.

SOMETIME AROUND 2008 a critical mass of human rights groups and American lawmakers started asking a crucial question: What about the minerals? What if Congo's mineral trade could be cleaned up and the rebel ATM shut down? A "blood diamonds" campaign in the late 1990s had exposed how the West African diamond trade was funding rebellions on that side of Africa. What about a similar conflict-minerals campaign for Congo?

On July 21, 2010, President Barack Obama signed the Dodd-Frank financial-reform bill, an 848-page behemoth that included a special section on conflict minerals. The law called for publicly listed American companies to disclose whether any of their products included minerals from mines controlled by armed groups in or around Congo. Though Dodd-Frank did not explicitly ban corporations from using Congo's conflict minerals, it made big companies worry about being linked with what is arguably the world's worst humanitarian disaster.

Even before the legislation was enacted, some leading electronics companies such as Intel, Motorola, and HP had begun tracking the

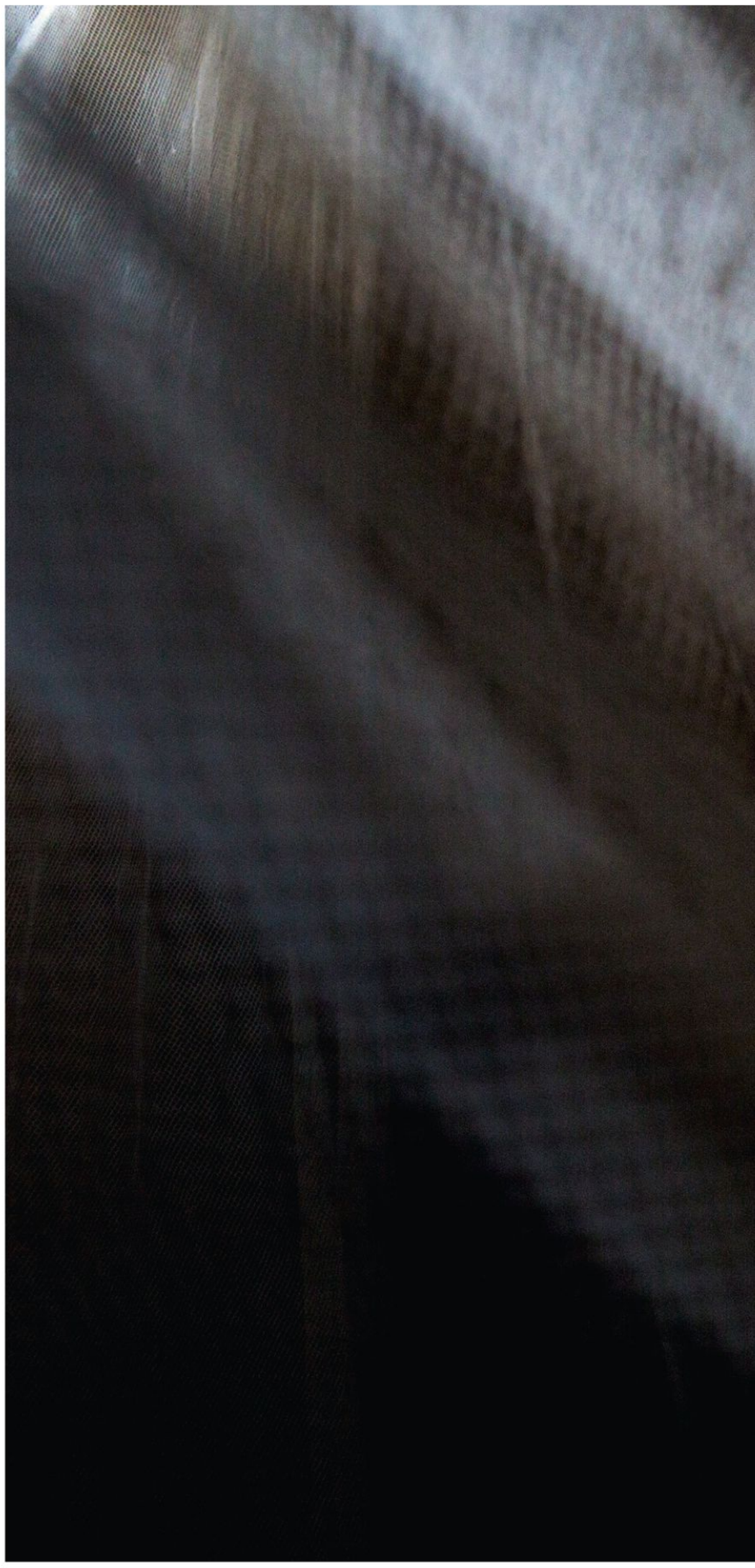
NGM MAPS. SOURCE: INTERNATIONAL PEACE INFORMATION SERVICE

minerals used in their products. Since the law went into effect, many other companies, but not all, have also made progress auditing their supply chains, according to the Enough Project, an American nonprofit that ranks major company efforts to create a clean minerals trade.

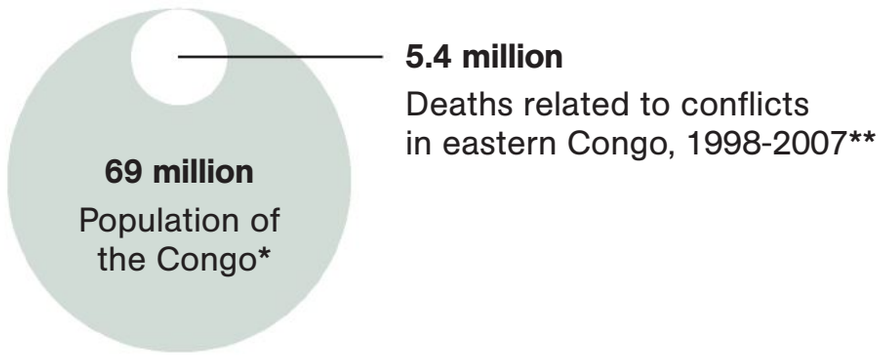
Chuck Mulloy of Intel concedes that complying with the new regulations eats into profits (he won't estimate how much), but "we don't want to support people who are raping, pillaging, and killing. It's as simple as that." By the end of 2012 Intel's microprocessors were conflict free for tantalum, though the company cannot guarantee that a dash of other conflict minerals, like gold, tin, or tungsten, hasn't made it into their microchips.

One of the criticisms of Dodd-Frank was that it might prompt electronics companies to simply boycott all minerals from Congo, which would inadvertently hurt local miners' livelihoods. And this did happen, at least at first. Multinationals stopped buying tin and tantalum ore from smelters unable to prove that their minerals did not fund conflict. And in September 2010 the Congolese government issued a six-month ban on all mining and trading activities in the east—devastating thousands of miners.

But then the first green shoots of a reformed mining trade began to emerge. Congolese authorities started inspecting mines. The army kicked out the militias and rogue soldiers and sent in



Conflict in the Congo has killed more than five million people since 1998, about the population of a city like Atlanta. An additional two million are displaced.



Gold, tantalum, tin, and tungsten are components in most of the electronic devices that are multiplying in U.S. homes.



*2012 ESTIMATE. **LATEST AVAILABLE DATA
NGM ART. SOURCES: POPULATION REFERENCE BUREAU; U.S. CENSUS BUREAU; PEW INTERNET & AMERICAN LIFE PROJECT



A woman left for dead faces a long recovery at a Hope in Action shelter in Goma. A 2007 study estimated that more than a million Congolese women have been raped at least once in their lifetime.

newly trained mining police to monitor the sites. Armed groups that were trading in tin, tantalum, and tungsten saw their profits drop by 65 percent. Congo's mines were starting to clean up.

We visited one "green," or conflict-free, mine, in Nyabibwe, a mining center that stretches for miles in a valley not far from Lake Kivu. The mountainside was crawling with young, hulking men wearing rags and headlamps, hammering, digging, shoveling, scooping, scraping, and hauling away every possible speck of yellowish cassiterite rock, or tin ore. Their cheeks bulged with chunks of sugarcane for energy. It was an antlike army expending millions of calories and gallons of sweat to feed a vast and distant global industry. None of the men knew much about Dodd-Frank, and when asked about the regulations, most grumbled that the price of cassiterite was still too low.

In Nyabibwe all of the easy-to-reach cassiterite was dug up long ago, so today's miners must bore deep into the mountain, using only hammers and

The Rubaya camp in North Kivu Province is home to 50,000 people uprooted by fighting between the government and M23, a Rwanda-backed rebel group.



shovels. Inside one tunnel, named Maternity, the mother tunnel, the walls were moist and slimy and narrower at each step. In the thick darkness there was no sense of up or down, just the drip, drip, drip of water and the faint sound of men singing from deep in the bowels of the Earth.

The miners lug the sacks of cassiterite out of the tunnels on their backs and drag them down to a little hut at the bottom of the mountain, where clerks weigh them, record the numbers in a big book, and affix a plastic bar-code tag indicating that this cassiterite is conflict free.

We were confused. Wasn't the government supposed to be fighting the rebels?

Then onward by motorbike or pickup to Bukavu, the main town, to be loaded onto tractor trailers bound for Rwanda and then to Dar es Salaam, Tanzania, a big port on the Indian Ocean. The cassiterite ends up in Malaysia, where it is smelted at more than 2,200 degrees Fahrenheit and then sold to electronics companies.

The Nyabibwe mine used to be run by Congolese soldiers. But in 2011 the government ordered the military out. Since then, reports indicate that military-led smuggling may still be going on at the mine. But when we were there, in January of this year, we didn't see any soldiers, militiamen, or child laborers. The record books looked pretty clean. Nyabibwe seemed like progress.



THE PROBLEM is that there are still too few clean mines. Only about 10 percent of mines in the east—55 in total—have been deemed conflict free. Although most tin, tantalum, and tungsten mines have been demilitarized, gold mines remain largely in army or rebel hands. Government officials collude secretly with rebel chiefs like Cobra Matata to make money, as we learned when we tried to get to the Bavi gold mine.

After our arrest, soldiers interrogated us in the small, dark house in Bunia for hours: "Who took you to Bavi? What was the purpose of your trip? Where did you go?" they shouted.

We were confused. We knew Bavi was rebel controlled. We'd seen all those rebel child soldiers there with our own eyes. So why did a government intelligence officer have us arrested? Wasn't the government supposed to be fighting the rebels? When we were released, security agents tailed us and slept in a car outside our hotel.

"You stumbled into a game," explained a United Nations official with years of experience in Congo. "They are all sharing the illegal spoils. It's a scramble. It's grab as much as you can."



A boy's hope for a normal life is as tenuous as his shelter in a camp for displaced people near the Nyiragongo volcano. As long as the corrupt trade of conflict minerals continues, fear and greed will rule eastern Congo.

He pointed to the recent scandal of Gen. Gabriel Amisi, Congo's land-forces commander, who was suspended after UN investigators revealed that he was covertly arming brutal rebel groups, selling them weapons and ammunition that helped them poach elephants for ivory. All this while he was ostensibly fighting the same rebels. A game indeed. A double game.

"The government is crumbling, and everybody is trying to do a deal and cut Kinshasa out," the UN official said. "Those guys in Bavi didn't want you seeing what they were up to."

When we asked him what it would take to fix Congo, he looked down at his polished shoes for a long time. "There's no easy solution," he said. "And I'm not even sure there is *any* solution."

The next day we flew out of Bunia in a small prop plane. Below us, the banana trees faded into dark green swirls and the thatched-roof villages turned into tiny brown dots as we crossed over the same beautifully sculpted mountains where all that treasure lay buried. □



Mattias Klum, Sarawak, Borneo, 2008 *A bird's-eye view offers indisputable evidence of environmental destruction, as roads and terraced fields erase biodiversity in favor of just one species: the oil palm tree. The profitability of palm oil has sent the crop sprawling across an area the size of Switzerland.*


prove



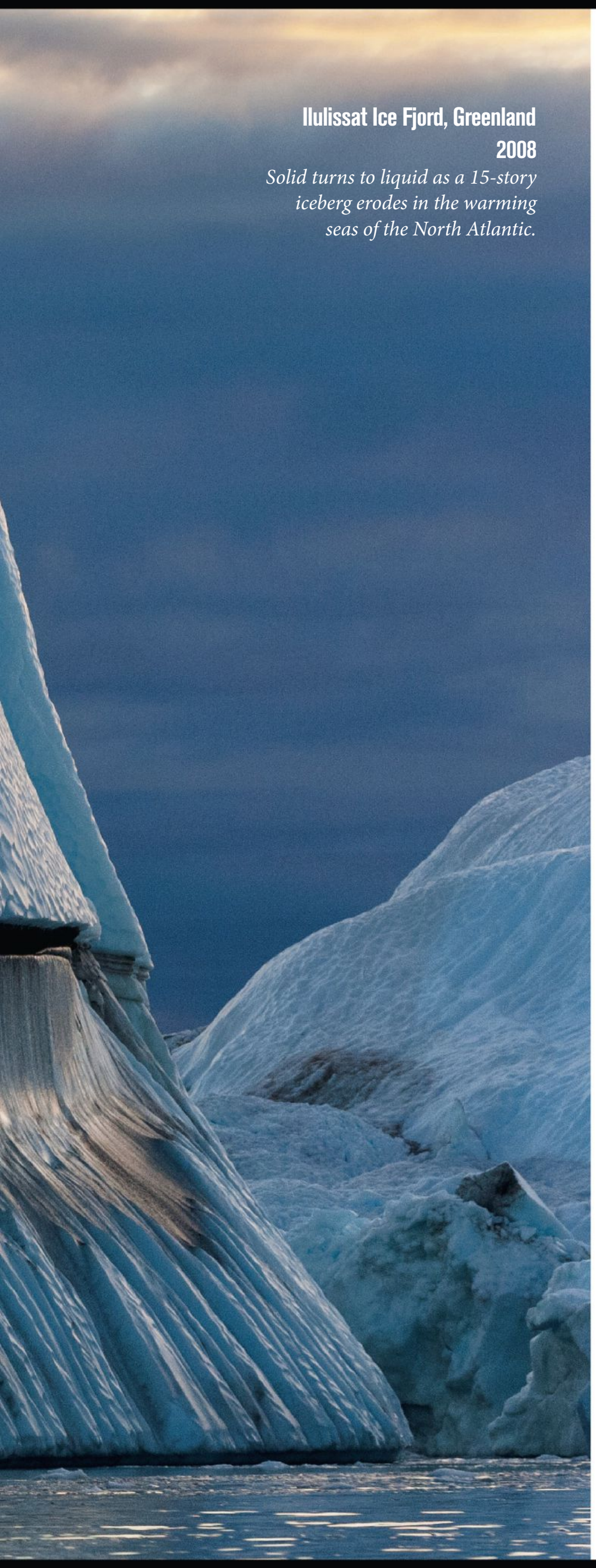
A photograph is powerful proof. It's indisputable evidence.

—Brian Skerry

Joel Sartore, Queen Bess Island, Louisiana, 2010 *When 200 million gallons poured into the Gulf of Mexico during the BP oil spill, Sartore documented the damage to coastal ecosystems. "You could see the life draining out of it," said parish official P. J. Hahn, who rescued this oiled brown pelican.*

Brian Skerry, Gulf of California, Mexico, 2011 *Snared and doomed by a gill net, a thresher shark is among an estimated 40 million sharks killed each year just for their fins. Drawing attention to this unsustainable practice has led some countries to ban the trade of shark fins, considered a delicacy in Asia.*

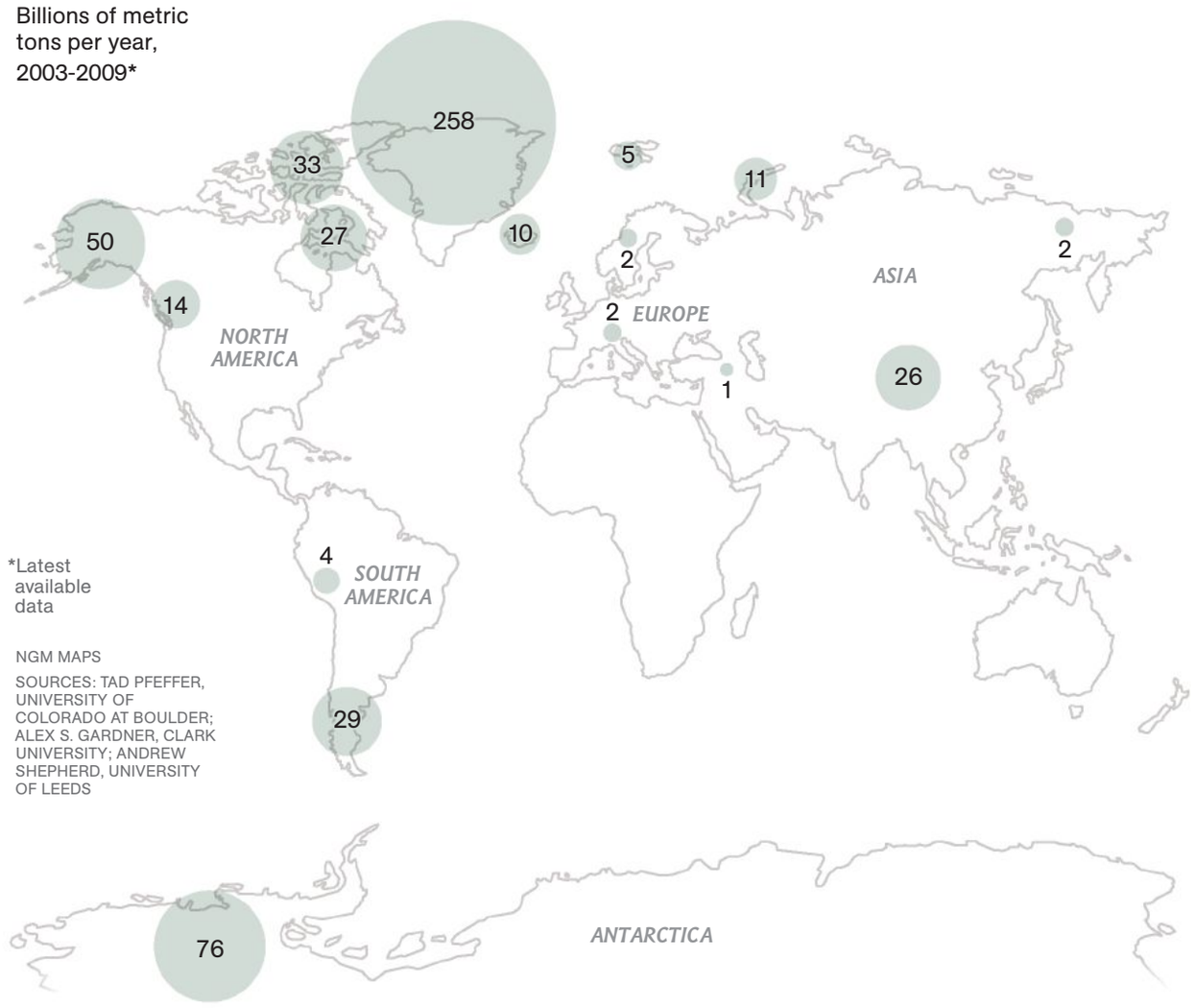

[prove]
MELTDOWN
Glaciers are supposed to advance
or retreat at a glacial pace.
Now they're disappearing before our eyes.



Ilulissat Ice Fjord, Greenland
2008

Solid turns to liquid as a 15-story iceberg erodes in the warming seas of the North Atlantic.

Glacier and ice-sheet losses contributing to sea-level rise





Photographs by
James Balog

We know the climate is changing, but wrapping our minds around that fact can be difficult. The Extreme Ice Survey makes the changes tangible: Through nearly a million time-lapse photographs, we now have indisputable, gut-wrenching proof that ancient glaciers are disappearing. I started this project in 2007 thinking it would last two years. We deployed 25 solar-powered cameras alongside glaciers in Greenland, Iceland, Alaska, the Alps, and the Rocky Mountains. I never expected to see such huge changes in such a short period of time. The photographs show glaciers breaking apart and melting faster than we had imagined. So now the survey will go on indefinitely, expanding into South America and Antarctica. Someone must bear witness to these monumental changes.

We can't ever stop. People need to see that climate change is real.

A video interview with James Balog can be viewed on our digital editions.



Columbia Glacier, Columbia Bay, Alaska

2006 *When Balog first photographed the debris-streaked Columbia Glacier, its face had retreated 11 miles since 1980. That pace compelled him to launch the Extreme Ice Survey, installing cameras at 18 glaciers to witness climate change.*



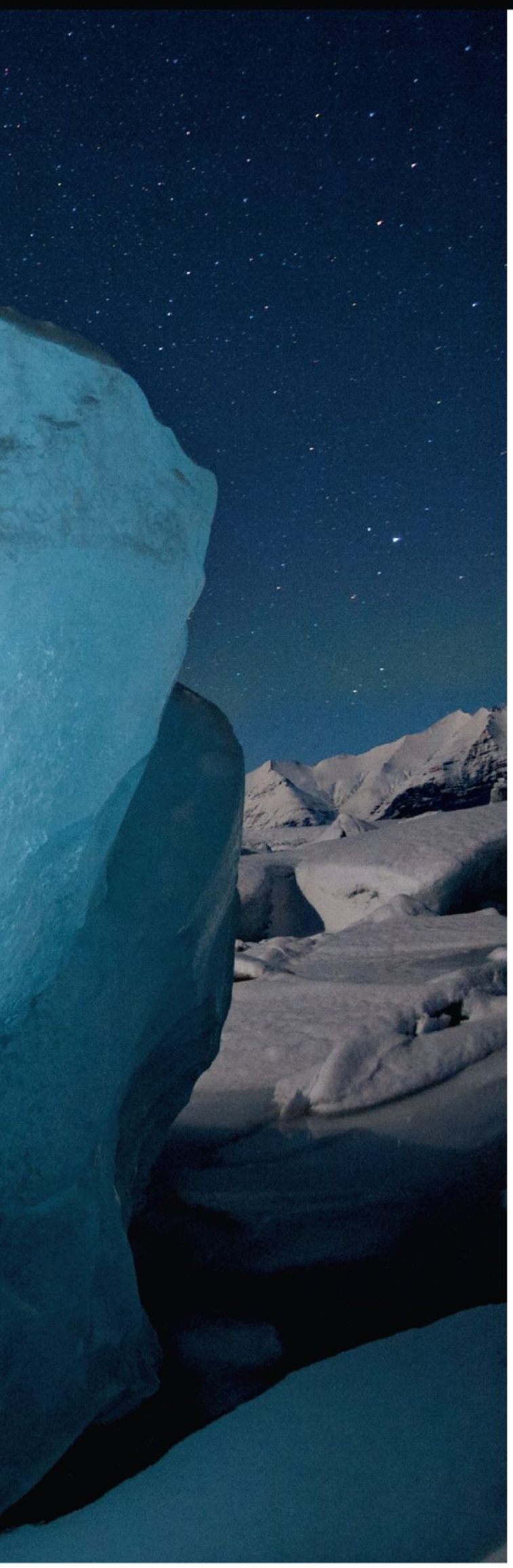
2012 *Iceberg-choked Prince William Sound reveals that the retreat of the Columbia Glacier is accelerating: It's lost two more miles of ice in six years. And since 1980 it has diminished vertically an amount equal to the height of New York's Empire State Building.*

EXTREME ICE SURVEY WITH MATTHEW KENNEDY



Jökulsárlón, Iceland

2009 *Destined to melt, an 800-pound chunk of ice glows*
beach. The ice washed up in a lagoon formed by a r
ice diamonds, finding beauty as well as tragedy in a



in moonlight on a wintry Icelandic receding glacier. Balog calls such pieces disappearing glaciers.

By Robert Kunzig

Glaciers are wild beasts. Back in our pre-industrial days we feared them like wolves—except glaciers ate whole villages. By the late 19th century they'd become tourist attractions; in Switzerland you could venture into the belly of the Rhône Glacier through a tunnel dug each summer next to the Hotel Belvedere. By then we had also begun creating a world that may one day have no room for glaciers. But for now, beasts they remain.

They breathe. Snow stacks up to become ice in the upper altitudes of a glacier; it melts down near the snout. "The glacier breathes in in winter, then breathes out in summer," says Matthias Huss, a young glaciologist at the University of Fribourg in Switzerland. In August a quarter of the water flowing in the Rhône River comes from melting glaciers.

They move. When enough ice weighs down on it, ice itself can flow. "When it's not moving, it's stagnant ice—it's not a glacier," says Dan Fagre, pointing at a shriveled white patch in Montana's Glacier National Park. He has worked there for two decades as a climate change ecologist. There are 25 active glaciers in the park, but a century ago there were 150. Many disappeared before they could be put on a map. We know them by their moraines—the piles of rubble they plowed up as they slid downhill, back when they were alive and moving.

They rule(d). Twenty thousand years ago Switzerland was a sea of ice; only the high Alps protruded as wind-shattered islands. In the 19th century the remnants of this Ice Age surged a bit, at the end of what's now called the Little Ice Age. An 1849 daguerreotype shows the snout of the Rhône Glacier extending about 1,700 vertical feet lower than it does now. It fell down a steep escarpment, its ice crags suffused with blue light, and crept along the valley floor like a frozen amoeba. An amoeba several stories high.

Daring to rub shoulders with such monsters during the Little Ice Age is what allowed Swiss scientists to realize—from moraines and other tracks high in the mountains—that big ice ages once happened. It's how we learned that Earth's climate can change profoundly. If we weren't changing it now ourselves, if nature were still in control, we'd be due for another ice age in a millennium or two. Conversely, if we burn all the coal, oil, and gas still underground, we'll melt every last speck of ice on Earth. Glaciers remind us: We're at an interesting fork in the road.

They struggle. As the world warms, a glacier seeks balance: an altitude and a mass at which snow added above equals ice melted below. "It struggles to adapt, but it's not that easy," Huss says. Weather is local, the struggle is individual, and so a few glaciers on Earth are still advancing—but only a few, and none in the Alps. Half the ice there has melted in the past century, enough to fill all the lakes in Switzerland. Eighty to 90 percent of what's left, Huss predicts, will be gone by 2100.

The Rhône Glacier has retreated up the mountain, out of sight from the valley. It ends now just above the Hotel Belvedere, and in summer you can still walk into it. To see it in winter, when it's alone and in its element and the road to the hotel is closed, you have to snowshoe up a mountain. From there, as crows circle above and snow swirls around you, the beast will be at your feet: an undulating white serpent, hauntingly quiet. But also breathing hard.

Glacier Park will still be beautiful without the glaciers, Fagre says. Switzerland too, says Huss, but he adds: "For me, it hurts to see at the end of the summer that all the snow has melted and they're just losing mass. It hurts." ▯

Robert Kunzig is the magazine's senior editor for environment. See more of James Balog's Extreme Ice Survey at extremeicesurvey.org.

relate





Stephanie Sinclair, Ghor Province, Afghanistan, 2006 *An intimate portrait—like this pre-wedding shot of Faiz, 40, and Ghulam, 11—connects us with the people behind the statistics. Some 46 percent of Afghan girls marry before they're 18. Sinclair has brought global attention to the issue of child brides.*





I fall in love with almost every person I photograph. I want to hear each story. I want to get close. This is personal for me.

—Stephanie Sinclair

Steve McCurry, Mumbai, India, 1995 *In one of India's richest cities many remain on the outside looking in. A mother and her child seek alms through a taxi window during a monsoon. McCurry is best known for portraits, including his image of Sharbat Gula, the Afghan girl.*

William Albert Allard, Puno, Peru, 1982 *Eduardo Ramos erupts in tears after a speeding car killed six of his family's sheep. The picture prompted a flood of donations from readers. The result: six new sheep for Eduardo, a water pump for his village, and tuition for Andean schoolchildren.*

[relate]

THE CHANGING FACE

We've become a country where race is no longer so black or white.

Yoel Chac Bautista, *7, Castaic, California*
Self-ID: black/Mexican/"Blaxican"
Census box checked: black

OF AMERICA

Tayden Burrell, *5, Sarasota, Florida*
Self-ID: black and white/biracial
Census boxes checked: white/black



McKenzi McPherson, *9, Houston, Texas, with her parents, Alison, 36, and Lawrence McPherson, 40. Self-ID: brown/mixed black and white Census boxes checked: white/black*



Photographs by
Martin Schoeller

I love the intimacy of a close-up portrait because it captures the essence of a person: It's not about their clothes or their environment—there are no hints of social status. Everything is summed up in the face. I may take 40, 50, 100 pictures of a person, and the one I like best is when the face hasn't caught on to the next expression the brain wants it to make. I like building catalogs of faces that invite people to compare them. We have an idea of what the human eye—or the nose or the lip—is supposed to look like. But when you compare 10, 20, 100 sets of eyes, you see how different they are. I take pictures of people from such varied backgrounds and cultures and ethnicities, but in the end we're all just human beings. I may photograph the President one day and a homeless person a week later. I want to challenge the way we use appearance to shape identity.

A video interview with Martin Schoeller can be viewed on our digital editions.

By Lise Funderburg

What is it about the faces on these pages that we find so intriguing? Is it simply that their features disrupt our expectations, that we're not used to seeing those eyes with that hair, that nose above those lips? Our responses can range from the armchair anthropologist's benign desire to unravel ancestries and find common ground to active revulsion at group boundaries being violated or, in the language of racist days past, "watered down."

Out in the world, the more curious (or less polite) among us might approach, asking, "Where are you from?" or "What are you?" We look and wonder because what we see—and our curiosity—speaks volumes about our country's past, its present, and the promise and peril of its future.

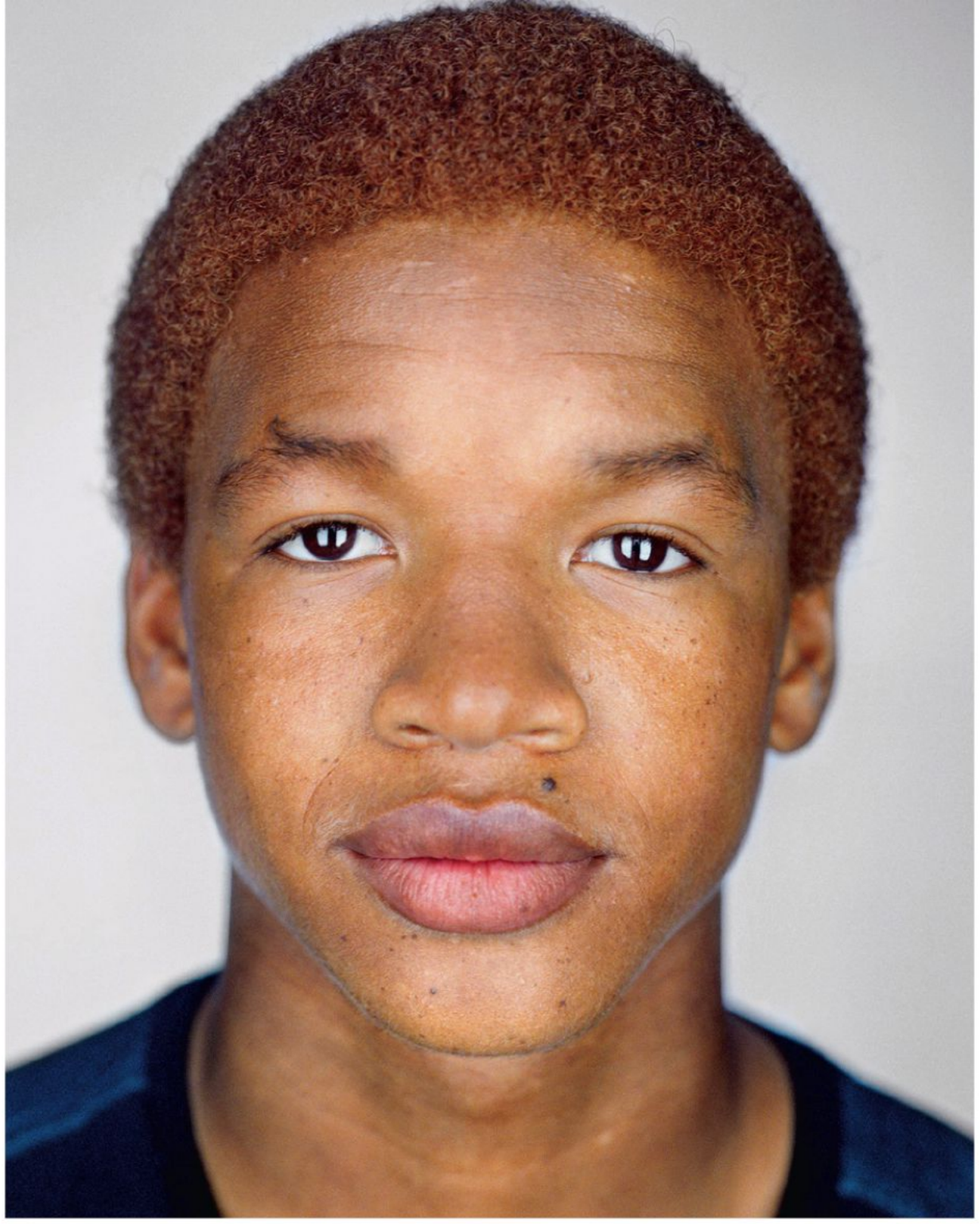
The U.S. Census Bureau has collected detailed data on multiracial people only since 2000, when it first allowed respondents to check off more than one race, and 6.8 million people chose to do so. Ten years later that number jumped by 32 percent, making it one of the fastest growing categories. The multiple-race option has been lauded as progress by individuals frustrated by the limitations of the racial categories established in the late 18th century by German scientist Johann Friedrich Blumenbach, who divided humans into five "natural varieties" of red, yellow, brown, black, and white. Although the multiple-race option is still rooted in that taxonomy, it introduces the factor of self-determination. It's a step toward fixing a categorization system that, paradoxically, is both erroneous (since geneticists have demonstrated that race is biologically not a reality) and essential (since living with race and racism is). The tracking of race is used both to enforce antidiscrimination laws and to identify health issues specific to certain populations.

The Census Bureau is aware that its racial categories are flawed instruments, disavowing any intention "to define race biologically, anthropologically, or genetically." And indeed, for most multiple-race Americans, including the people pictured here, identity is a highly nuanced concept, influenced by politics, religion, history, and geography, as well as by how the person believes the answer will be used. "I just say I'm brown," McKenzi McPherson, 9, says. "And I think, Why do you want to know?" Maximillian Sugiura, 29, says he responds with whatever ethnicity provides a situational advantage. Loyalties figure in too, especially when one's heritage doesn't show up in phenotypical facial features, hair, or skin. Yudah Holman, 29, self-identifies as half Thai and half black, but marks Asian on forms and always puts Thai first, "because my mother raised me, so I'm really proud of being Thai."

Sandra Williams, 46, grew up at a time when the nation still turned on a black-white axis. The 1960 census depicted a country that was still 99 percent black or white, and when Williams was born six years later to parents of mixed black and white ancestry, 17 states still had laws against interracial marriage. In Williams's western Virginia hometown, there was only one Asian child in her school. To link her own fair skin and hair to her white ancestry, Williams says, would have been seen by blacks as a rejection. And so, though she views race as a social construction, she checks black on the census. "It's what my parents checked," she says.

In today's presumably more accepting world, people with complex cultural and racial origins









Sandra Williams *(top), 46, Chicago, Illinois*
Self-ID: biracial/"human being"
Census box checked: black

Hosanna Marshall, *32, New York, New York*
Self-ID: African American, Native American, white, and Jewish
Census box checked: black

Kelly Williams II *(top),* **17,** *Dallas, Texas*
Self-ID: African American and German/multiracial
Census box checked: black

Maya Joi Smith, *9, Cary, Illinois*
Self-ID: black and Asian/Korean and African American
Census box checked: black









Julie Weiss *(top), 33, Hollywood, California*
Self-ID: Filipino, Chinese, Spanish, Indian, Hungarian, and German Jew
Census boxes checked: white/Asian Indian/Chinese/Filipino

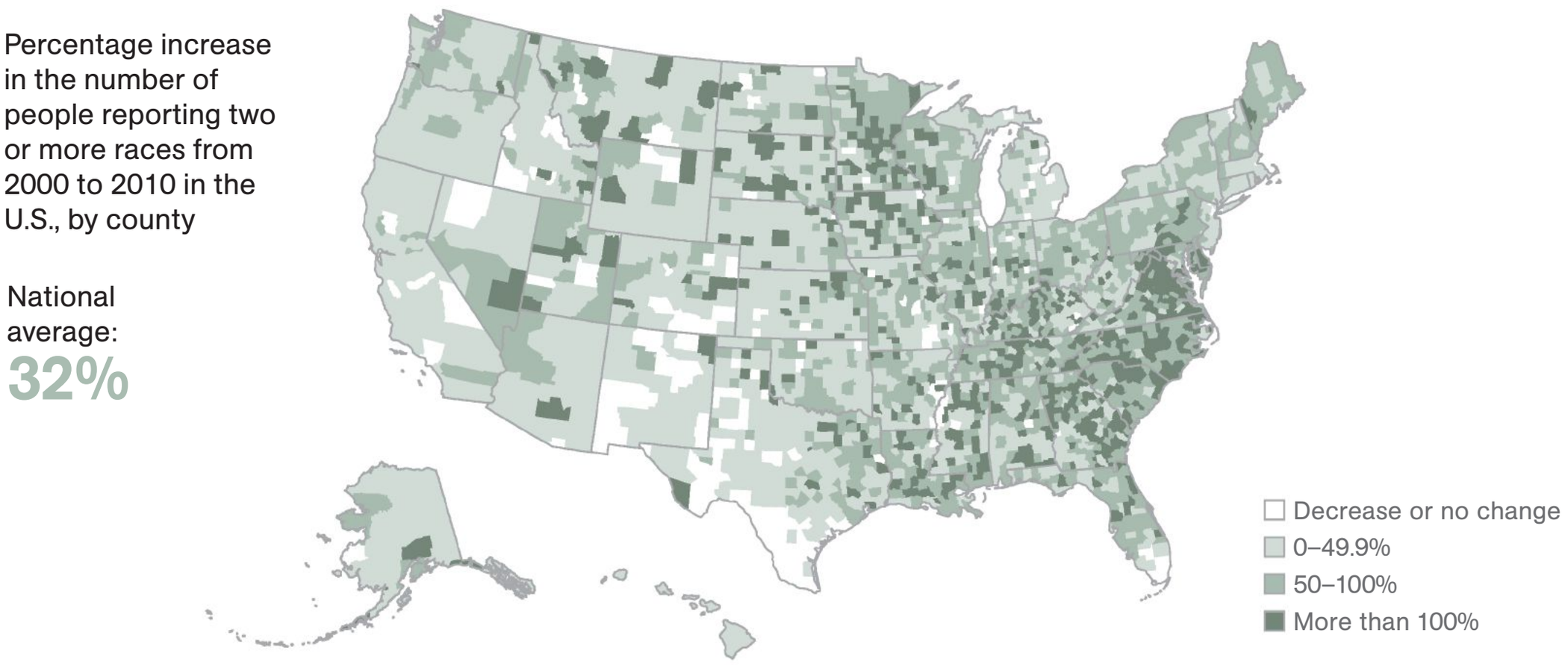
Maximillian Sugiura, *29, Brooklyn, New York*
Self-ID: Japanese, Jewish, and Ukrainian
Census boxes checked: white/Japanese

Joshua Ahsoak *(top), 34, Anchorage, Alaska*
Self-ID: Jewish and Inupiat Eskimo/"Juskimo"
Census box checked: Alaska Native

Daisy Fencl, *3, San Antonio, Texas*
Parents' ID for her: Korean and Hispanic
Census box checked: has not yet been counted



Imani Cornelius, *13, Shakopee, Minnesota*
Self-ID: black and white | Census box checked: black
Imani needs a bone marrow transplant, but a shortage of African-American and multiracial donors has kept her waiting for two years, because matches rely on shared ancestry.



become more fluid and playful with what they call themselves. On playgrounds and college campuses, you'll find such homespun terms as Blackanese, Filatino, Chicanese, and Korgentinian. When Joshua Ahsoak, 34, attended college, his heritage of Inupiat (Eskimo) and midwestern Jewish earned him the moniker Juskimo, a term he still uses to describe himself (a practicing Jew who breaks kosher dietary laws not for bacon but for walrus and seal meat).

Tracey Williams Bautista says her seven-year-old son, Yoel Chac Bautista, identifies himself as black when he's with her, his African-American parent. When he's with his father, he'll say Mexican. "We call him a Blaxican," she jokes, and says she and her husband are raising him in a home where Martin Luther King, Jr., is displayed next to Frida Kahlo. Black relatives warn Williams about the persistence of the one-drop rule, the long-standing practice of seeing anyone with a trace of black "blood" as black. "They say, 'He may be half, but he's still the N word.'"

Certainly, race still matters in this country, despite claims that the election of Barack Obama heralded a post-racial world. We may be a pluralist nation by 2060, when the Census Bureau predicts that non-Hispanic whites will no longer be the majority. But head counts don't guarantee opportunity or wipe out the legacy of Japanese-American internment camps or Jim Crow laws. Whites, on average, have twice the income and six times the wealth of blacks and Hispanics, and young black men are twice as likely as whites to be unemployed. Racial bias still figures into incarceration rates, health outcomes, and national news: A recent Cheerios commercial featuring an interracial family prompted a barrage of negative responses, including claims of white genocide and calls for "DIEversity."

Both champions and detractors of that ad based their views on what's known as the eyeball test: A study of brain activity at the University of Colorado at Boulder showed that subjects register race in about one-tenth of a second, even before they discern gender. In May researchers reported that political conservatives are more likely than liberals to categorize ambiguous black-white faces as black. We assign meaning in the blink of an eye.

When people ask Celeste Seda, 26, what she is, she likes to let them guess before she explains her Dominican-Korean background. She points out that even then she has revealed only a fraction of her identity, which includes a Long Island childhood, a Puerto Rican adoptive family, an African-American sister, and a nascent acting career. The attention she gets for her unusual looks can be both flattering and exhausting. "It's a gift and a curse," Seda says.

It's also, for the rest of us, an opportunity. If we can't slot people into familiar categories, perhaps we'll be forced to reconsider existing definitions of race and identity, presumptions about who is us and who is them. Perhaps we'll all end up less parsimonious about who we feel connected to as we increasingly come across people like Seda, whose faces seem to speak that resounding line from Walt Whitman's "Song of Myself":

"I am large, I contain multitudes." □

Lise Funderburg is the author of Black, White, Other *and* Pig Candy. *When asked, "What are you?" she often describes herself as a woman of some color.*

TED SICKLEY, U.S. CENSUS BUREAU. SOURCE: CENSUS 2000 AND 2010 CENSUS



Cameron Benjamin, *22, Los Angeles, California*
Self-ID: Hawaiian, Chinese, and Caucasian
Census boxes checked: white/Chinese/Native Hawaiian









Ariel Toole *(top), 14, Chicago, Illinois*
Self-ID: mixed race/multiracial
Census boxes checked: white/black/Vietnamese

Mariyam Nayeri, *33, Brooklyn, New York*
Self-ID: Mexican and Saudi
Census box checked: some other race

Adrian Adrid *(top), 24, Haleiwa, Hawaii*
Self-ID: white
Census boxes checked: white/Filipino

Yudah Holman, *29, Los Angeles, California*
Self-ID: half Thai, half black
Census box checked: other Asian

Jordan Spencer, *18, Grand Prairie, Texas*
Self-ID: black/biracial
Census box checked: black



Celeste Seda, *26, Brooklyn, New York*
Self-ID: Dominican and Korean
Census boxes checked: Asian/some other race

reveal



Randy Olson, Mumbai, India, 2011 *Seeking to capture the throng in Churchgate Station, Olson coached a local assistant through the laborious process needed to get this shot, because the perfect vantage point was closed to foreigners. "After four hours we had this picture—and a small victory over Indian bureaucracy."*


कृपया थूकिये नहीं
Smart Card
Churchgate
12F चर्चगेट
VIRAR
2057
3



You want to reveal what life is like—to show things we may never fully understand.

—Lynn Johnson

Lynsey Addario, Baghdad, Iraq, 2011 *Look closely and your expectations of a culture start to shift. In this shot, taken when headlines focused on car bombings and mortar attacks, moviegoers at Baghdad's first 4-D cinema get an extra thrill from shaking seats and wind machines during a 3-D sci-fi film.*

Lynn Johnson, Dimen, China, 2008 *Catching moments of ordinary life requires slowing down and waiting for an invitation to come inside. On a visit home to celebrate the New Year, television actress Wu Qinglan screens one of her star turns with her grandmother. Her family was the first in town to own a TV.*

[reveal]

NOW YOU SEE IT

Inside North Korea's tightly controlled society, the truth is rarely simple.



A traffic guard goes through the motions in the capital of Pyongyang, where streets are almost empty of cars.

Members of one of the world's largest militaries, over a million strong, pack a stadium in Pyongyang in 2012 during celebrations honoring North Korea's first leader, Kim Il Sung.

A singer weeps after performing a song praising her new leader, Kim Jong Un, at a 2012 rally in Pyongyang. Only citizens deemed loyal are allowed to live in the capital.





Morning light shines on a worker and a goldfish tank at the Korean Central News Agency in Pyongyang.



Photographs by
David Guttenfelder

I've covered global stories where foreign photographers are everywhere. But in North Korea I'm usually the only one. So I feel this responsibility, that if I don't take a certain picture, it won't be seen at all. For decades the only pictures we had of the country were propaganda images. So most people think of North Korea as a cardboard facade, where everything is staged and nothing is real. When I first visited in 2000, that's how I saw it too. But since the Associated Press opened a bureau in Pyongyang in 2012, I've visited the country 25 times and taken thousands of images behind the facade. Let me be clear: I'm not allowed to travel freely. I can't photograph nuclear reactors or prison camps. But my work is not censored. Many of the spectacles I document are staged. But the people are real. I've come to see North Koreans as ordinary people, not simply as actors on a geopolitical stage. I want people who see my pictures to make the same journey. In a world where nearly everything has already been photographed, it has become my job to reveal what it's like inside this closed society.



A video interview with David Guttenfelder can be viewed on our digital editions.



By Tim Sullivan

The monks followed us out to the parking lot. It was a cool autumn morning, and there was silence inside the Ryongthong Temple, a hillside complex of Buddhist shrines outside the North Korean city of Kaesong. Centuries ago Kaesong was home to Korea's kings, and Ryongthong was a bustling religious center. But this morning the temple was empty. There were no ringing bells, no worshippers lighting incense—only two monks in gray robes walking through the complex with ostentatious serenity. Down in the city, loudspeakers on Kaesong's empty main street were bellowing songs of praise for Kim Jong Un, the young man North Koreans now call the Supreme Leader.

Photographer David Guttenfelder and I had come to the temple with our minders—the anxious government bureaucrats who accompany foreign reporters everywhere they go in North Korea. I briefly interviewed one monk, dutifully scribbling a few banalities in my notebook. "Buddhism helps people be clear, clean, and honest," he said.

A Buddhist temple in North Korea would seem a natural place for a reporter to ask about freedom of worship. Researchers say six decades of a one-family dictatorship have effectively crushed organized religion here. But if I asked, and one of the monks even hinted at any unhappiness with the regime, I knew he would go to prison, disappearing into a hidden gulag that human rights workers say holds between 150,000 and 200,000 people. So I didn't ask, and we walked out shortly after.

In the parking lot, though, as we slid open the door to the van that ferries us everywhere, the monks reappeared. A minder was beside them. All looked at us expectantly. Then the older monk spoke. "I know what you want to ask," Zang Hye Myong said.

Suddenly it was obvious why the monks had followed us. Minders do not introduce journalists to dissidents, and Ryongthong was no enclave of political critics. It was, as I should have known all along, a temple of totalitarian fakery, a movie set in which the stone steps and ornate wooden doors were barely worn. The monks were actors in a theatrical performance about North Korea's religious freedom.

We were the audience.

So I grumbled the question they were waiting for: "Are you free to practice your religion?"

The monk looked victorious. "Westerners believe it is not allowed to believe in religion in my country." He shook his head sadly. "This is false." He was proof, he said, of the freedoms given to Koreans by the "Great Leader" Kim Il Sung and now protected by his grandson Kim Jong Un. He looked directly at me to make his final point, as if he'd been practicing the line: "I want you to take the truth to the world."

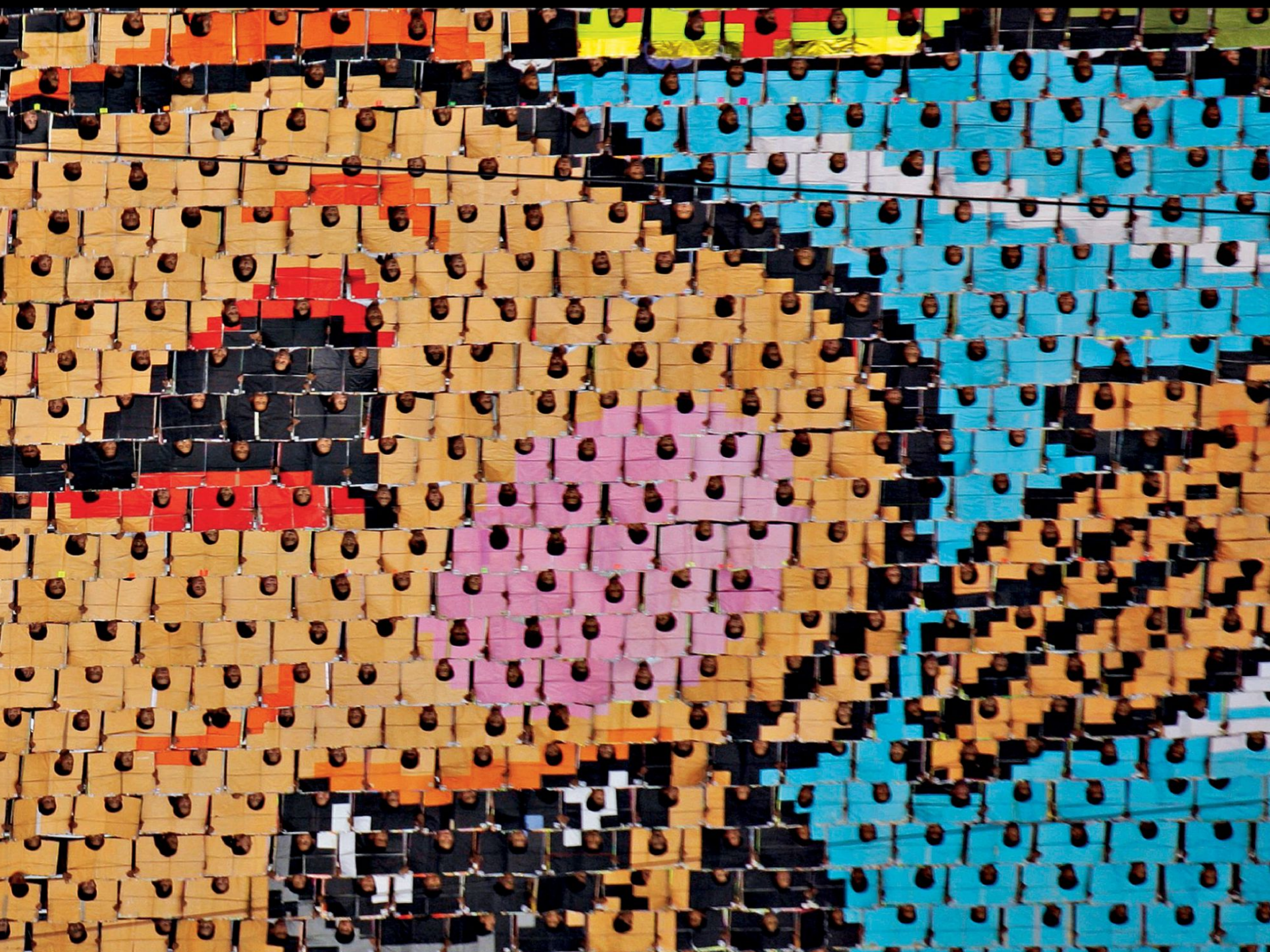
But the truth is rarely simple in North Korea. How to make sense of a country where the leader embraces basketball bad boy Dennis Rodman and a week later threatens to let loose an atomic firestorm on the United States? This is a country where the reality of everyday life is kept hidden behind carefully created facades, and most visitors see nothing but a few perfectly paved roads and a handful of monuments to the family—father, son, *(Continued on page 114)*

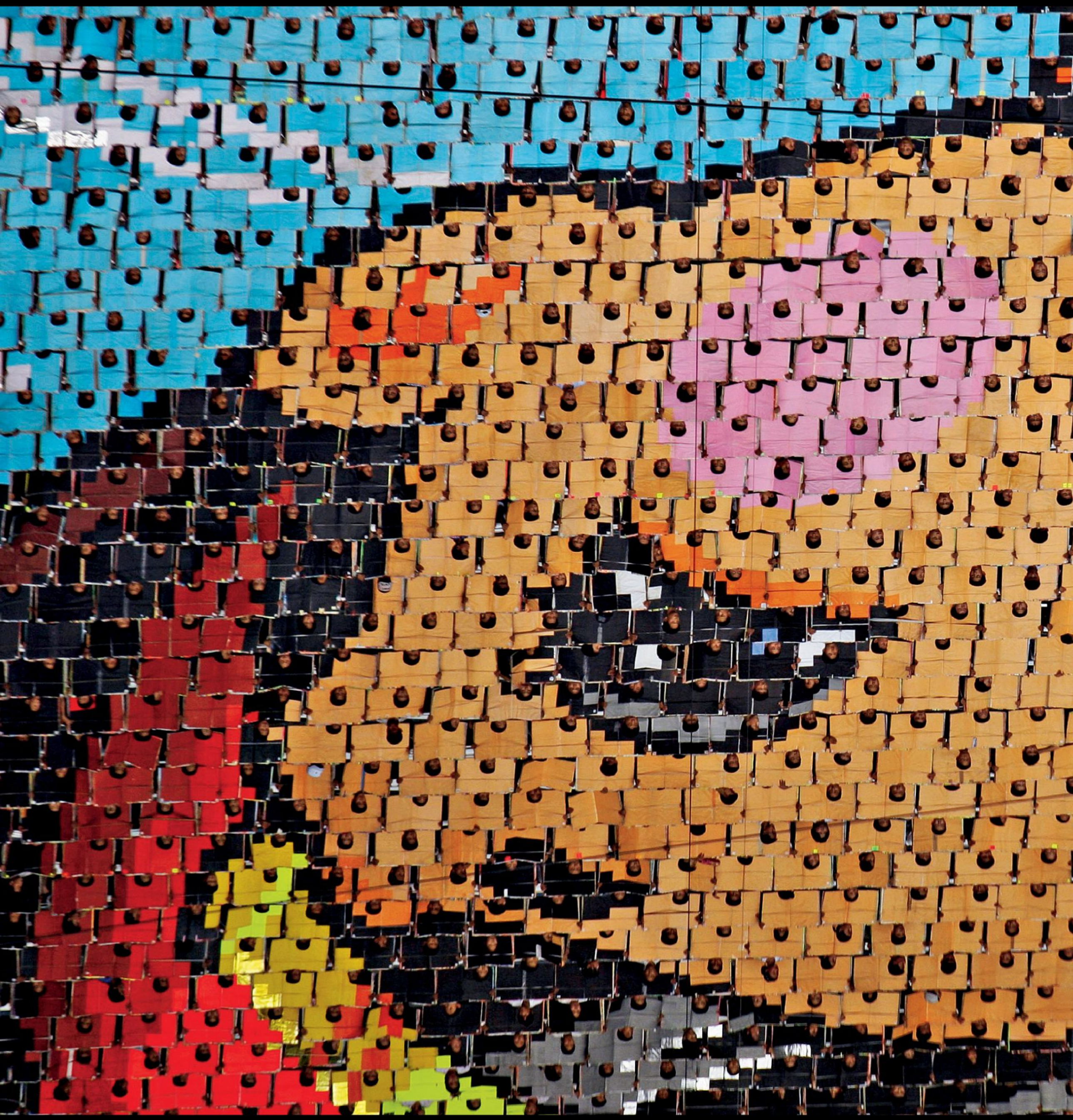
Tim Sullivan is a correspondent for AP. See more images of North Korea at davidguttenfelder.com.



View from a train window: In fields near the Chinese border, farming depends more on human and animal muscle than on machines. Chronic food shortages in North Korea—caused by floods, droughts, inefficiencies—have led to widespread malnutrition. Following pages: Children mobilized for the annual mass games in Pyongyang act as pixels to portray a happy patriot in uniform.









At dawn, portraits of Kim Il Sung and his son Kim Jong Il are still lit up in Pyongyang. Even during the city's blackouts, electricity is reserved to light the flame atop Juche Tower.

A military guide leads a tour to the mystical Mount Paektu. It was here, official lore says, that Kim Il Sung fought for independence from Japanese occupiers in the 1930s.



and now grandson—that has controlled life in North Korea for 65 years.

It's a country where reporting often feels like a series of strange, bloodless battles. Sometimes—like that morning at Ryongthong—the government wins. But if you stay long enough and look deeply enough, there are days when you learn more than you expected. It's why we keep coming back.

Over the past year David and I have been part of a small team of Associated Press journalists who have been able to visit North Korea regularly. We've traveled to collective farms, attended countless political rallies, and visited Pyongyang

People speak to reporters in surreal, mechanical hyperbole, spouting praise for their leaders.

hot spots like the Gold Lane bowling alley, where the capital's elite hoist battered balls made in America. In a country where dull, Soviet-inspired clothing had always been the rule, soldiers' girlfriends now parade through Gold Lane in short skirts and high heels, thanks to the capital's small but growing consumer economy.

But for the most part we still see only what our minders, and the powerful government agencies looming silently above them, allow. The minders meet us at the airport when we arrive and drop us off when we leave. Every morning they're waiting for us in the lobbies of our hotels, behemoths of relative luxury built for foreigners. They are places with reliable heat, electricity, and even Internet access but where guests spend their days lost amid acres of scuffed marble and floor after floor of empty rooms, wanderers in these failed attempts at 1970s Las Vegas elegance.

Our main minder is a pleasant but purposefully distant man named Ho Yong Il. He is with us at the Children's Department Store and during rallies in Kim Il Sung Square. He goes with us to restaurants and factories. Mr. Ho (he is always Mr. Ho to me) is our translator, our guide, and the man charged with never allowing us out of his sight. If we tried to slip away from him—something we have never tried to do—no doubt our visas would be revoked.

I spent far more time last year with Mr. Ho than with some of my closest friends. Yet after many attempts to get him to open up, here is what I know about him: He studied English. He once saw part of the movie *Gone With the Wind*. He likes Charles Dickens. His wife is a homemaker.

He is also a patriot. Though he is interested in the larger world, curious about American slang and how David and I work, his reverence for his homeland is obvious. To spend time with Mr. Ho is to see North Korea through the eyes of a believer. He clearly enjoys talking about his country's history, its leaders, and its monuments. But requests to see something unexpected—to visit a car dealership or watch a university history lesson—are usually met with Mr. Ho's warning "That might be difficult." Most of the time that means no—though it's rarely clear who actually makes the decision.

It's hard to know how much of what Mr. Ho allows us to see is real. One day he takes us to meet a pair of working-class newlyweds in their new three-bedroom Pyongyang apartment, with its 42-inch flat-screen TV. The apartment is in one of the city's showcase housing complexes, its outer skin a grid of blue and white bathroom tiles. These upscale towers near the Taedong River were built for the minuscule elite of the long-ruling Korean Workers' Party, or KWP. But Mr. Ho wants to prove that they're open to everyone. The couple, we are told, were given the apartment because the wife, Mun Kang Sun, had been declared a Hero of the Republic for her astonishing productivity at a textile factory.

Mun, a demure woman in her early 30s who looks much older, sits quietly as her husband speaks. "All the people of my country are like one big family with the leaders as our parents," says Kim Kyok, a technician at the same factory. He says his apartment shows how the regime cares for its people. But as he speaks, he picks nervously at his fingers. A trio of people—two minders and a tall, scowling man no one bothers to introduce—is listening to everything. In a country where meeting foreigners without

official permission is illegal, the pressure on the couple is clearly immense.

Always there are questions I can't ask. Do the couple really live in that apartment? If they do, are they required to keep it constantly ready to show to foreigners, a living diorama of Kim Jong Un's promises to bring prosperity to a people accustomed to poverty and famine? Are their neighbors all from the party elite?

IF REPORTING INSIDE NORTH KOREA sometimes leaves David and me with as many questions as answers, it can still offer a rare view into the long-isolated world the Kim family has created. Piece by piece, we are assembling a collection of fragile and often confusing moments into a picture of a country that works hard to make itself difficult to understand.

We've learned that what we see in passing is often more revealing than our destination. We've found that unguarded moments can be captured in photographs taken from bus windows and that wrong turns can provide revealing details. Like the time our bus driver accidentally veered off a perfectly maintained Pyongyang street onto a narrow, dusty road pocked with potholes and lined with unlit buildings. Or when we spotted a moldy tower of apartments one evening, each room lit by a single naked bulb casting a sickly yellow light. We have ventured outside the relative prosperity of Pyongyang to cities without modern high-rises, where dimly lit stores contain half-empty shelves.

It is necessary to go outside the country—to South Korea, Britain, or China—to find the only North Koreans who can speak freely about the realities of totalitarian life: the ones who have left. "Looking back, I wonder now why we had to live such sad lives," says a former North Korean coal miner, who fled to Seoul in 2006 because his father was politically suspect. Refugees describe a hidden caste system based on ideological background: Three generations of a family can be imprisoned if one member is convicted of a political crime.

The coal miner is one of about 25,000 North Koreans who have escaped to South Korea since the war. They have fled political repression, an enveloping police state, and desperate poverty. The UN estimates that one-third of North Korean children are chronically malnourished. But the number of refugees has dropped dramatically since late 2011, when Kim Jong Un tightened security along the once porous 880-mile border with China. In 2012 only about 1,500 North Koreans made the dangerous journey.

The North Korean government, of course, works relentlessly to present a view of life in which schools are filled with happy, well-fed children, stores are filled with goods, and loyalty to the Kim family is universal. People know to speak to reporters in surreal, mechanical hyperbole, spouting praise for their leaders. "Thanks to the warm love of the 'Respected General,' Kim Jong Un, even rural people like us can come here and enjoy mini-golf," Kim Jong Hui, a 51-year-old housewife from the country's remote northeast, tells me one day at the country's first putt-putt golf course, in Pyongyang. Overwhelmed by this benevolence, she says, "I have made up my mind to do my duty to help build a prosperous, powerful state."

It is easy, after many such encounters, to believe in the caricature of North Koreans as Stalinist robots. The challenge is to find the far more elusive—and more prosaic—reality. Sometimes that takes stumbling onto a subject that gets North Koreans to open up a bit.

Like *Gone With the Wind*. This nation revels in the 77-year-old novel, finding echoes of itself in the tale of civil war and the ruthless, beautiful woman who vowed never to go hungry again. More than one million North Koreans are estimated to have died or gone missing in the Korean War, and hundreds of thousands more died in a 1990s famine that tore deep into the country. The government, for reasons never made clear, had the book translated in the mid-1990s, when North Korea was struggling to survive without Soviet aid and the mass starvation was under way.

In a country with few entertainment choices that have escaped the propaganda bureaucrats, the novel gripped the capital. Today it's hard to find an adult in Pyongyang who hasn't



A man tends to his bicycle outside a housing complex in Kaesong, not far from the border with South Korea. An exclamation point at the end of an emphatic propaganda slogan punctuates the scene.

read it. A guide at the Grand People's Study House, a musty Pyongyang monolith, sees the book as proof that American women are poorly treated. A Kaesong bureaucrat, a haughty man with a fading blue-striped tie, sees the book as a Marxist morality tale. A woman with a troubled marriage tells me she discovered strength in Scarlett O'Hara's cold-blooded tenacity. The book is entertainment and solace and inspiration. It's a window into America. It's a celebration of a people who, like the North Koreans, are fiercely proud of fighting the Yankees.

You can see that North Korean toughness in the middle-aged women sitting on the ground on a frigid night, seemingly comfortable in cheap cotton overcoats as they watch a fireworks display. You can see the longing for knowledge in Pyongyang, where electricity often disappears without warning and where a late-night drive can find dozens of people downtown, standing under streetlights with newspapers and schoolwork. Even after the bizarre mass rallies and the



pledges to die for the motherland end, there are informal gatherings with surprising echoes of small-town America, as gossiping old women and flirting young people fill the streets. Sometimes, though, the truth about ordinary North Korean life is hidden right inside the Potemkin displays.

LIKE THE DANCING. I first saw it on a Sunday evening in Pyongyang, in a clearly orchestrated show of uniformity and loyalty, when nearly 500 couples danced in the shadow of three stone fists thrust into the sky. Each fist wielded a tool—a hammer, a sickle, and a pen—that together formed the symbol of the KWP. The men wore short-sleeve shirts and ties. Women wore the filmy polyester dresses that pass here for traditional clothing. They twirled in well-practiced circles and between songs stood silently in pairs. Few people smiled. Most had the blank expressions common at mass rallies, where boredom, resignation, and patriotism often mix together. Officials rushed around, barking at anyone who fell out of step. That night I couldn't imagine anyone celebrating life with the stiff dances of that staged event.

Today it's hard to find an adult in Pyongyang who hasn't read Gone With the Wind.

But a few nights later, at about 2 a.m., I opened my hotel-room window to look out over the city. The streets were empty. There were no security convoys, no movements of soldiers, nothing unusual. I heard music somewhere in the distance. Leaning out, I could see lights blazing at a small building a couple of blocks away.

It was a party. Looking through binoculars, I could see dozens of people gathered in the building's courtyard. Bottles were being passed around. I could see the orange glow of cigarettes.

Many of the people were dancing. It was the same dance I'd seen a few days earlier, but with the swing and sway of people enjoying themselves. Listening hard, I heard snatches of the same music wafting through the night.

Were they celebrating a birthday? A promotion? A wedding? I'll never know. But it was a reminder of what goes on when no one knows a journalist is watching.

"We are normal," a former North Korean black marketeer who now lives in Seoul once told me. "Please don't forget this. People live, people compete to get jobs, people fight. There are the basic elements of life like there are in South Korea or the United States."

Or anywhere. □

celebrate



John Stanmeyer, Dzitnup, Mexico, 2010 *A single frame can transport us to one of our planet's far-flung and beautiful places. In this one, stalactites and a sunbeam spotlight a swimmer in the Xkeken cenote, a natural well in the Yucatán thought by the Maya to lead to the underworld.*



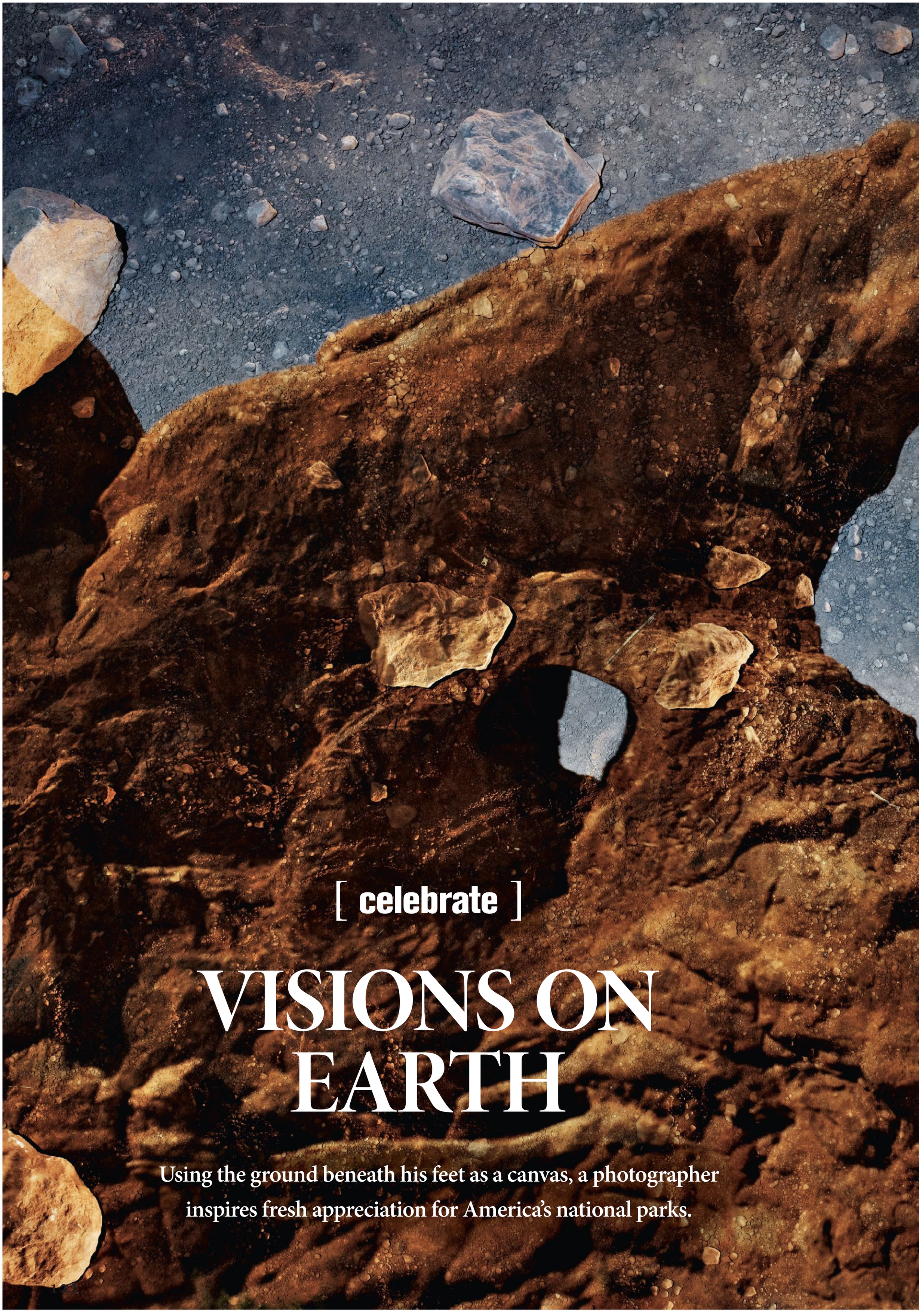


My job is to open people's eyes to all the amazing things they didn't know existed.

—George Steinmetz

Simon Norfolk, Uxmal, Mexico, 2007 *To capture the magic of this ancient Maya city of the Classic period, Norfolk lit the ruins like a movie set and shot them at night. Light radiates and refracts through the ornate roof combs of the House of the Doves, a showcase of the Puuc architectural style.*

George Steinmetz, Maranhão, Brazil, 2009 *At Lençóis Maranhenses National Park ribbons of sand trap the rains from January to May. When the lakes evaporate, the undulating dunes earn their nickname: "bedsheets." Steinmetz uses a motorized paraglider to fly close over spectacular landscapes.*



[celebrate]

VISIONS ON EARTH

Using the ground beneath his feet as a canvas, a photographer inspires fresh appreciation for America's national parks.

Turret Arch, Arches National Park, Utah

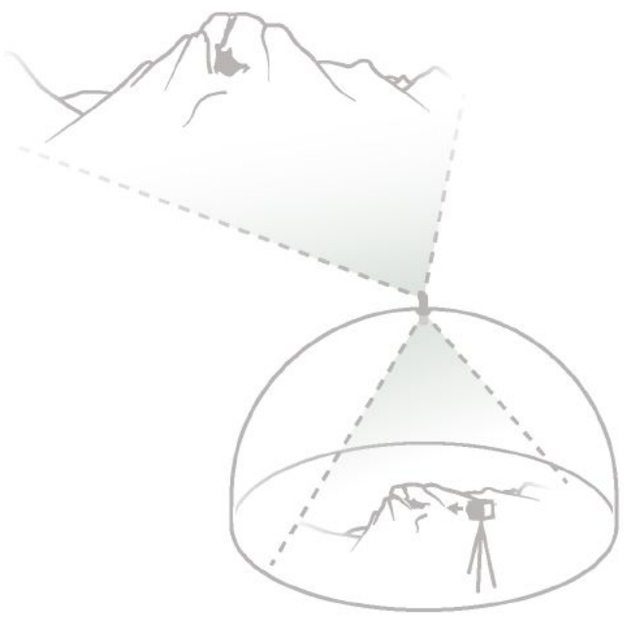


Mount Moran, Grand Teton National Park, Wyoming



Photographs by
Abelardo Morell

Since 1991 I've been obsessed with making pictures from hotel rooms that I've converted into camera obscuras. A few years ago I went to West Texas and had this fantasy of photographing the desert the same way, but of course there are no rooms in the desert. So I used a tent. The tent became a way to see the surrounding landscape projected directly onto the ground itself. I got excited about the idea that this could be a way to celebrate all the iconic places in the West—places that are hard to see in a fresh way because they've been photographed a billion times. I mean, how many pictures of Old Faithful are there? But with this way of making pictures, I felt like I could give these incredibly important landscapes a new urgency. They're kind of hopeful, because just when you think you're tired of this old world, there's a new way of seeing it.



A periscope lens in the top of the tent projects the image 90 degrees down onto the ground inside.



A video interview with Abelardo Morell can be viewed on our digital editions.

By Tom O'Neill

To reach Bridalveil Fall in Yosemite Valley, photographer Carleton Watkins traveled heavy. The year was 1861, not long after the frenzy of the California gold rush, and 31-year-old Watkins tackled the Sierra Nevada like a prospector expecting riches. He led a procession of mules, their backs loaded with heavy glass photographic plates and jars of chemicals. After a 50-mile tramp, Watkins staked his claim on a patch of ground in full view of the spectacular waterfall. He set his camera on a tripod and waited for the good light.

One hundred fifty years later, it was Abelardo Morell's turn. "I didn't have that hard a time getting there," the 65-year-old says wryly. In Yosemite National Park the Cuban-born Morell pulled off a paved road and walked a short way to the bank of the Merced River. Close to where Watkins stood, he pitched a domed tent with a periscope on top. Morell positioned his digital camera inside and waited for the good light.

Separated by a chasm of decades and technologies, Watkins and Morell were identical in their goal: to make photographs that would open eyes to the majesty and profundity of the western landscape. In so doing, they and countless other photographers in between have celebrated the glories of one of America's finest creations—the National Park System.

Watkins and his fellow pioneers in wilderness photography—Timothy O'Sullivan, Eadweard Muybridge, William Henry Jackson—took advantage of a new development in photography, the use of large, transportable, chemical-coated glass plates to create exposures. Up to this time photographers were pretty much confined to studios, using small, sensitized copper plates to make portraits. Wet-glass technology, with its shorter exposures and less fragile equipment, freed photographers to work outdoors.

Compared with his 19th-century pacesetters, Morell is practically an antiquarian, adapting one of the earliest known viewing mechanisms—the camera obscura. Since the 1990s, Morell, recently retired as a professor of photography at the Massachusetts College of Art and Design, has been following the most basic of optic principles: focusing light through a small opening onto a dark surface. At first he used rooms as his reflecting plane, projecting outside images of streets, skyscrapers, bridges, and fields onto dark walls and floors and capturing the surreal double vision on his camera. Now Morell himself has gone outdoors, using the ground, rough and intimate, as his backdrop.

With two aims in mind—paying homage to the early photographers and challenging people today to reimagine postcard views—Morell has been setting up his camera obscura rig in national parks across the West. And so the familiar scene of Bridalveil Fall appears, in Morell's vision, as a dreamlike vista painted on a canvas of pine needles, grass, and weeds. Old Faithful gushes beneath a scrim of gravel and twigs, as if glimpsed behind frosted glass. A galaxy of pebbles glows around a sandstone arch.

In making these lovely, haunting images, Morell can't claim the dramatic results of his predecessors, whose photographs catalyzed the founding of America's first national parks. Morell's accomplishment is subtler, but still daring. He looks at some of our most treasured natural wonders and lets us see them in unexpected ways, the sublime brought down to earth. □

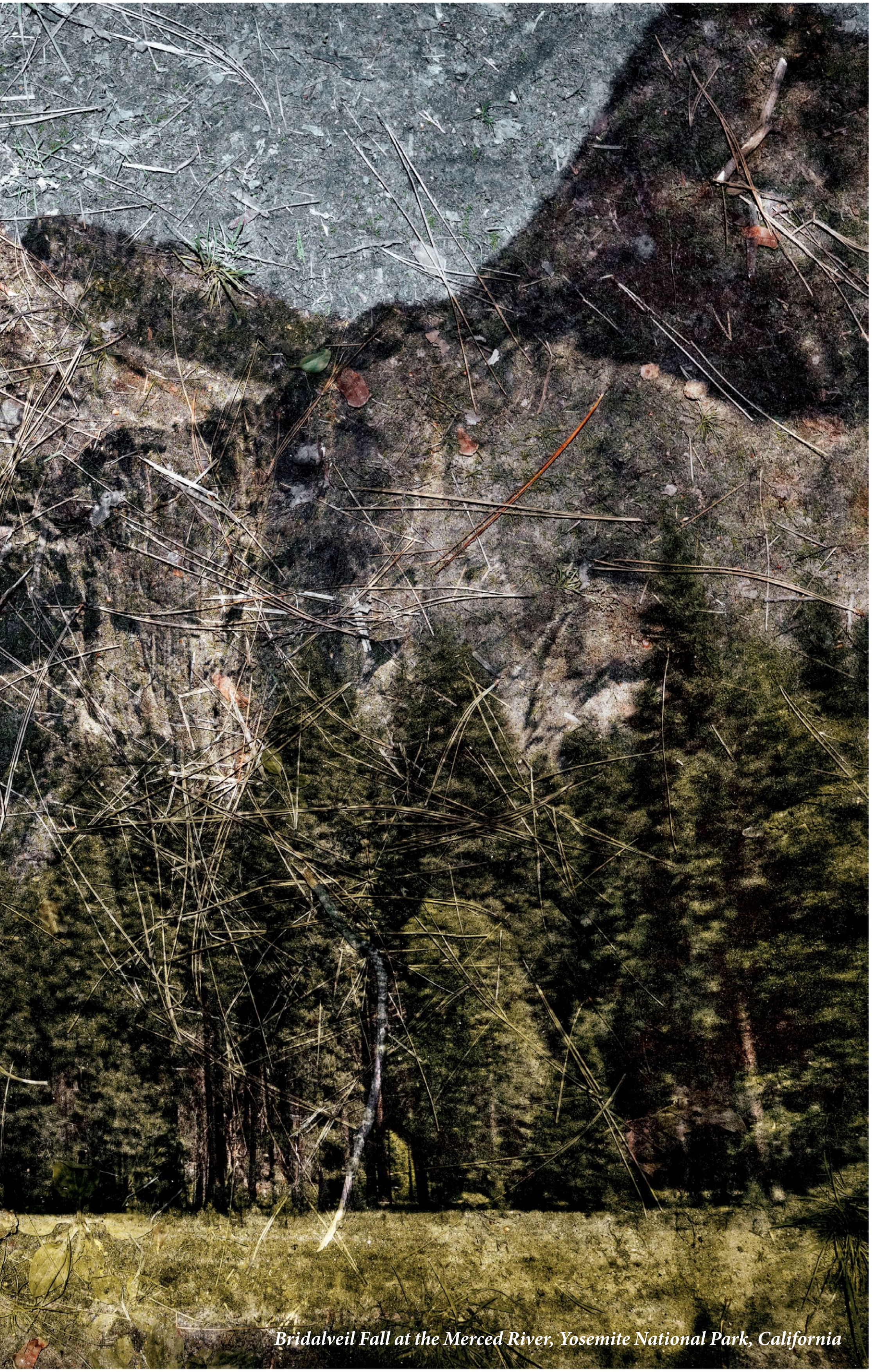
Tom O'Neill is a senior writer for the magazine. To learn more about Abelardo Morell and his photography, visit houkgallery.com.



Old Faithful, Yellowstone National Park, Wyoming







Bridalveil Fall at the Merced River, Yosemite National Park, California



Ruby Beach, Olympic National Park, Washington







Michael Nichols, David Sheldrick Wildlife Trust, Kenya, 2011 *A baby elephant whose mother was killed by poachers rests at a Nairobi nursery. Producing call-to-action photographs of endangered wildlife is a passion for Nichols, who was instrumental in the creation of a national park system in Gabon.*



My pictures are about making people realize we've got to protect those who can't speak for themselves.

—Michael "Nick" Nichols

Paul Nicklen, Antarctica, 2006 *"I expected this leopard seal to flee with her catch, a live penguin chick, but she dropped it on my camera," says Nicklen. Since these aggressive mammals eat whatever they find in the variable ice pack, scientists track their diets to gauge changes caused by global warming.*

Jim Brandenburg, Ellesmere Island, Canada, 1987 *A male arctic wolf bounds across ice floes, patrolling the borders of his remote realm. That isolation, north of latitude 75° N, has kept arctic wolves safe from the hunting and habitat destruction that threaten every other subspecies of gray wolf.*

[protect]

BUILDING THE ARK

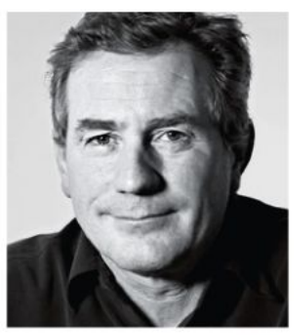
Zoos may have to choose between keeping the animals we most want to see and saving the ones we may never see again.

Florida panther
Tampa's Lowry Park Zoo, Florida

Rescued as a kitten after being abandoned in the wild by its mother in 2007, Calusa, nicknamed "Lucy," is one of no more than 165 surviving Florida panthers.

PUMA CONCOLOR CORYI
IUCN STATUS: NOT YET ASSESSED





Photographs by
Joel Sartore

Half of all the species on Earth could be headed irreversibly toward extinction by 2100. Not if I can help it. That's the idea behind the Photo Ark: getting the public to look these creatures in the eye, then care enough to save them while there's still time. My goal is to photograph as many of the world's captive species as I can before time runs out. I'm at about 3,000 now, and just getting started. I work mostly at zoos and aquariums, today's keepers of the kingdom. Many species would already be gone without their heroic captive-breeding efforts. Studio-style portraits on black or white backgrounds level the playing field: A tortoise counts as much as a rhino. The power of photography is that you literally freeze time with it. Long after I'm gone, these pictures are going to keep on working every day to save species. There's no more important mission, because it's folly to think that we can doom wildlife to oblivion and believe humans will be just fine.

That's a world I hope to never lay eyes on.

Orange-bellied parrot

Healesville Sanctuary, Victoria, Australia

NEOPHEMA CHRYSOGASTER
IUCN STATUS: CRITICALLY ENDANGERED

A video interview with Joel Sartore can be viewed on our digital editions.



Giant panda

Zoo Atlanta, Georgia

AILUROPODA MELANOLEUCA
IUCN STATUS: ENDANGERED

African wild dogs
Omaha's Henry Doorly Zoo & Aquarium, Nebraska

Born at two different zoos in 2010, a trio of hand-reared pups were united in Omaha to become part of a pack, essential to their health and survival.

LYCAON PICTUS
IUCN STATUS: ENDANGERED





Golden snub-nosed monkeys
Ocean Park, Hong Kong

Animals with "Dr. Seuss looks," like these rare Chinese primates, bring visitors and research money to zoos, says photographer Joel Sartore.

RHINOPITHECUS ROXELLANA
IUCN STATUS: ENDANGERED





Greater one-horned (Indian) rhinoceroses

Fort Worth Zoo, Texas

Four-month-old Asha (Hope in Hindi) will stick close to its mother for up to two years. In zoos and in the wild, this rhino species is growing in numbers.

RHINOCEROS UNICORNIS
IUCN STATUS: VULNERABLE





Plowshare tortoises
Zoo Atlanta, Georgia
ASTROCHELYS YNIPHORA
IUCN STATUS: CRITICALLY ENDANGERED

By Elizabeth Kolbert

Dr. Terri Roth got into her scrubs, pinned her long brown hair up in a bun, and pulled on a clear plastic glove that stretched over her right forearm, past the elbow, and almost to her shoulder. Her 1,500-pound patient, a rhinoceros named Suci, was maneuvered into a narrow stall. While one of her colleagues fed Suci apple slices out of a pail, Roth pulled a second glove over the first and grabbed what looked like a video game remote. Then she stuck her arm deep into the rhino's rectum.

Two days earlier, Roth, director of the Center for Conservation and Research of Endangered Wildlife at the Cincinnati Zoo, had tried to inseminate Suci, a Sumatran rhino born at the zoo in 2004. The artificial insemination (AI), which Roth had also performed wearing a shoulder-length glove, had involved threading a long, skinny tube through the complicated folds of Suci's cervix. According to Roth's notes, Suci had "behaved very well" during the procedure. Now it was time for a follow-up ultrasound. Grainy images appeared on a computer screen propped near Suci's substantial rump. Roth located the rhino's bladder, which appeared on the screen as a dark bubble, then continued on. At the time of the AI, an egg in Suci's right ovary seemed to be on the verge of being released. If, indeed, it had been, there was a chance Suci could have become pregnant this cycle. But the egg was still there, right where Roth had last seen it, a black circle in a cloud of gray.

"Suci did not ovulate," Roth announced to the half dozen zookeepers who had gathered to help with the ultrasound. The group let out a collective sigh. "Oh no," someone said. Though clearly disappointed, Roth immediately began to plan for Suci's next cycle.

If giving a rhino an ultrasound seems extreme, consider this: When the Cincinnati Zoo opened its gates, in 1875, there were perhaps as many as a million Sumatran rhinos browsing forests from Bhutan to Borneo. Today there may be fewer than a hundred left in the world. Three of these—Suci and her brothers, Harapan and Andalas—were born in Cincinnati. Six years ago the zoo sent Andalas to Sumatra, where he has since sired a calf at Way Kambas National Park. If the species survives, it will in no small part be thanks to the 16 years Roth has spent collecting blood samples, testing hormones, and doing ultrasounds on animals in captivity.

And what goes for the Sumatran rhino goes for a growing list of species saved from oblivion. As the wild shrinks, zoos are increasingly being looked to as modern-day arks: the last refuge against a rising tide of extinction.

ALTHOUGH COLLECTIONS of exotic animals have existed for thousands of years—in the 15th century B.C., Hatshepsut, one of ancient Egypt's few female pharaohs, presided over a menagerie of monkeys, leopards, and giraffes—the zoo, both as a concept and a reality, is a relatively recent invention. The first zoological society in the United States was formed in 1859, in Philadelphia, with the goal of creating something grander and more edifying than the traveling animal shows and city menageries popular at the time.

Elizabeth Kolbert's book The Sixth Extinction *will be published early next year. More of Joel Sartore's Photo Ark can be seen at* photoark.com.

The Civil War intervened, and it took another 15 years for the Philadelphia Zoo to open. It was soon joined by the Cincinnati Zoo and the Cleveland Zoo.

From early on, American zoos had a hand in conservation. At the end of the 19th century the Cincinnati Zoo tried—unsuccessfully—to breed passenger pigeons, whose numbers were in steep decline. (The bird that's believed to have been the very last passenger pigeon, named Martha, died at the zoo in 1914, and the building where she lived is now a memorial.) And in the early years of the 20th century, when one count showed just 325 wild bison left in North America, the Bronx Zoo started a captive-breeding program that helped save the species. But zoos have to support themselves, and the sorts of animals that draw crowds are not necessarily the sorts that most need help.

Robert Lacy, a conservation biologist at the Chicago Zoological Society, says that zoos are going to have to make "some really difficult prioritization decisions. Do you save a small number of big furry things, because that's what will draw the public? Or do you focus on a whole lot more little creatures that it's harder to get the public interested in, but you might be able to save a whole lot more of for the same amount of money?"

Others argue that the situation is becoming so dire in the 21st century that zoos are going to have to fundamentally rethink their mission. Why devote any resources to species that are doing fine on their own?

"I think it's a bit of a cop-out to say the public wants to see x, y, or z," says Onnie Byers, chair of the Conservation Breeding Specialist Group, part of the International Union for Conservation of Nature (IUCN) Species Survival Commission. "Plenty of species need exactly the expertise that zoos can provide. I would love to see a trend toward zoos' phasing out species that don't need that care and using the spaces for species that do."

Among the animals that owe their continued existence to captive-breeding efforts by American zoos are the Arabian oryx, the black-footed ferret, the red wolf, the Guam rail, and perhaps most famous of all, the California condor. By 1982 the California condor population had dwindled to just 22 birds. Soon after, every one left in the wild was caught and taken to either the Los Angeles Zoo or the San Diego Zoo. Although the reintroduction of the birds has been plagued by problems—among other things, the zoos have found they need to train the animals to avoid electrocuting themselves on power lines—there are now more than 200 condors living outside of captivity.

Because such programs tend to be expensive—the condor recovery effort costs participating institutions up to two million dollars a year—

Zoos are the last refuge against a rising tide of extinction.

they're usually led by large big-city zoos. But littler zoos are increasingly joining in. The Miller Park Zoo, in Bloomington, Illinois, is one of the smallest accredited zoos in the country—just four acres. It has bred red wolves and is hoping to figure out how to breed an endangered subspecies of squirrel known as the Mount Graham red squirrel.

"It's a small animal that doesn't require a huge amount of space," says Jay Tetzloff, superintendent of the zoo. "And one of the zookeepers looked at me and said, 'Wouldn't it be cool to be the first zoo to breed that animal?'"

RIGHT NOW, AS A CLASS, the world's most threatened group of animals is probably amphibians. According to the IUCN, which maintains what's known as the Red List, more than a third of the world's frog, toad, and salamander species are at risk of extinction. Amphibians lack even the marginal charisma of a condor or a red wolf, and they clearly are no match for big-draw zoo species such as pandas or lions, which are not (yet) facing imminent extinction in the wild. But there are advantages to being small. For one thing a whole population of amphibians can be preserved in less space than that required by a

Polar bears
Columbus Zoo and Aquarium, Powell, Ohio

Twins Aurora and Anana have space for balletic moves at the Polar Frontier exhibit, which teaches visitors how the melting of sea ice affects wild polar bears.

URSUS MARITIMUS
IUCN STATUS: VULNERABLE



Reticulated giraffes
Cheyenne Mountain Zoo,
Colorado Springs, Colorado

North America's largest captive herd of reticulated giraffes, 18 in all, goes eye to eye with the public, which is encouraged to touch and feed the agreeable giants.

GIRAFFA CAMELOPARDALIS RETICULATA
IUCN STATUS: NOT YET ASSESSED





Bilby
Dreamworld, Queensland, Australia
MACROTIS LAGOTIS
IUCN STATUS: VULNERABLE

single three-quarter-ton rhinoceros like Suci.

"It's an amazing responsibility to have half the remaining members of a species in your care," says Jim Breheny, the director of the Wildlife Conservation Society's Bronx Zoo. He's standing in what used to be the zoo's veterinary hospital and is now a state-of-the-art breeding facility stacked with tanks of Kihanzi spray toads—mustardy yellow amphibians about the size of a quarter. He sounds like a new dad after a difficult delivery—proud and more than a little bit relieved.

Depending on how you look at things, the Kihanzi spray toad is either one of the most unfortunate or one of the luckiest species around. Until the late 1990s the toad was unknown to science. It was not described until a hydroelectric project was already ripping through its tiny habitat—five acres of mist-soaked wetlands in the Kihanzi River Gorge, in eastern Tanzania. In 2000, recognizing that the project would probably harm the newly discovered species, the Tanzanian government invited the Bronx Zoo to collect some of the animals to maintain as an "assurance colony."

Exactly 499 spray toads were captured; half stayed in the Bronx, and the others wound up at the Toledo Zoo. A few years later a deadly fungus that had been decimating amphibian populations worldwide showed up in the Kihanzi gorge. Between the pathogen and the effects of the hydro project, the toad's numbers plummeted. In 2004 researchers combing the area spotted only three tiny toads, and over the next few years, they found none. In 2009 the Kihanzi spray toad was declared extinct in the wild.

As all this was happening, the zoos were struggling to figure out how to re-create in a captive setting the highly specialized microhabitat that gives the toad its name. In the gorge a series of waterfalls had provided the toads with round-the-clock spray. In the Bronx each tank was fitted with its own little spray nozzle to mimic this effect. Among amphibians, Kihanzi toads are unusual in that they bear live young, which at birth are no bigger than a match head. For the tiny young, the zoo had to find even tinier prey; eventually they lit on minute arthropods known as springtails, which the researchers also had to figure out how to raise. The keepers noticed that the toads seemed to be suffering from a nutritional deficiency, so a special vitamin supplement had to be designed.

After some initial—and rather scary—losses, the toads began to thrive and reproduce. By 2010 there were several thousand of them in New York and Toledo. That year a hundred toads were sent back to Tanzania, to the University of Dar es Salaam. Meanwhile, with the help of the World Bank, the Tanzanians were working in the gorge. By diverting water from the falls, the hydro project had eliminated the mist that the toads depend on. The Tanzanians outfitted the gorge with a sort of giant sprinkler system and managed to restore the spray. In 2012 the first captive-bred toads were released back into the wild.

But for every success story like the Kihanzi toad, there are dozens of other species hanging on the edge of extinction. After checking in on the spray toads at the Bronx Zoo, Breheny showed off some recently hatched yellow-headed box turtles. The turtle, from China, is

critically endangered; no more than 150 are estimated to exist in the wild. Not long ago the zoo announced it was going to try to breed half the species on the list of the world's 25 most endangered turtles. It has appealed to other zoos to take on the remaining half.

"This can't be a missed opportunity," Breheny says. "Even if you're a small zoo, you can house one species or several species of turtles and really make a difference."

ON THE OTHER SIDE of the country, at the San Diego Zoo Institute for Conservation Research, Marlys Houck pulls a box of small plastic vials from a vat of liquid nitrogen. To protect her hands from the cold—the temperature inside the vat is minus 320°F—she's wearing what look like heavy-duty oven mitts. The vials are arranged upright, in little slots. Houck locates the two she wants and places them on a steel table. "There they are," she says.

Inside the vials is much of what's left of the *poʻouli,* a chunky bird with a sweet black face and a light chest that lived on Maui. The poʻouli probably went extinct a year or two after the San Diego Zoo and the U.S. Fish and Wildlife Service made a last-ditch effort to save it, in 2004. At that point a mere three individuals were thought to exist, and the idea was to capture all of them and try to breed them. But only one bird—a male—allowed himself to be netted.

When he died, two months later, his body was immediately sent to the San Diego Zoo. It was Thanksgiving weekend, and Houck rushed to the institute to harvest still living cells from the carcass. "This is our last chance," she remembers thinking. "This is the dodo." She succeeded in culturing some of the cells from the bird's eye, and the results of that effort now make up the contents of the vials. (The poʻouli's skin is now at the Smithsonian.) Houck doesn't want the cells to get so warm that they are damaged, so after about a minute, she places the vials back in the box and returns them to the vat. The liquid nitrogen gives off a misty, ghostlike vapor.

Along with thousands of other identical-looking vials, the tubes of poʻouli cells represent what might be described as a beyond-the-last-ditch conservation effort: the Frozen Zoo. Nearly a thousand species are represented in the Frozen Zoo, which occupies a single room on the institute's ground floor.

For now, at least, all but one of the species in deep freeze still have flesh-and-blood members. But it seems safe to predict that in the coming years, more and more will go the way of the poʻouli. Many of the animals in the "zoo" are highly endangered; these include the Sumatran orangutan, the Amur leopard, and the *puaiohi,* a songbird from Kauai. As I watch Houck put away the little vials, I wonder about a future in

Zoos may have to rethink their mission. Why devote resources to species that are doing fine?

which what counts as conservation all too often involves liquid nitrogen. Though frogs and toads enjoy the dubious distinction of belonging to the world's most endangered group, it's worth noting that extinction rates among many other classes are approaching amphibian levels: It's estimated that a third of all reef-forming corals, a quarter of all mammals, a fifth of all reptiles, and a sixth of all birds are headed toward oblivion.

"I think there are going to be more and more species where the only living material left is going to be cells in the Frozen Zoo," Oliver Ryder, the institute's director of genetics, tells me. As it happens, one such species, or really, in this case, subspecies—the northern white rhino—can be found just a few hundred yards from Ryder's office. Native to central Africa, the northern white rhino is down to its last seven individuals, and its extinction is at this point considered inevitable. Two of the seven—Nola, a female, and Angalifu, a male—live at the San Diego Zoo Safari Park, and when I leave the institute to go visit them, I find them basking in the late afternoon sun. The animals are both nearing 40 and too old to breed. But after they die, they will, in a manner of speaking, live on—one last hope, suspended in a frozen cloud. □



Mountain tapir

Los Angeles Zoo, California

In the future perhaps the only place to see a mountain tapir, endangered in its native Andes, will be in a zoo. This male is one of only nine in captivity.

TAPIRUS PINCHAQUE
IUCN STATUS: ENDANGERED











THE VISUAL VILLAGE

A group of photographers in Africa share snippets of ordinary life on an Instagram feed called Everyday Africa.







By James Estrin

Shutter speeds, f-stops, film speeds, ISOs: Aspiring photographers used to have to master the mechanics of a camera before they could hope to create an arresting image. Today, with the explosion of camera apps on our smartphones, we're all photographers, and pretty good ones at that, since the quality of smartphone images now rivals that of digital cameras.

The new ease of photography has unleashed a seemingly insatiable appetite for capturing the magical and the mundane. We are documenting everyday moments with manic intensity, whether it's an image of our breakfast, our cat—or the cat's breakfast. And rather than collect pictures in scrapbooks, we share and like and comment on them with friends and strangers around the globe. Even photojournalists are experimenting with mobile phones because their virtual invisibility makes it easier to capture unguarded moments. And the Internet allows them to bypass traditional media outlets to act as their own publishers, reaching huge audiences via social media sites such as Instagram. A photograph taken in
















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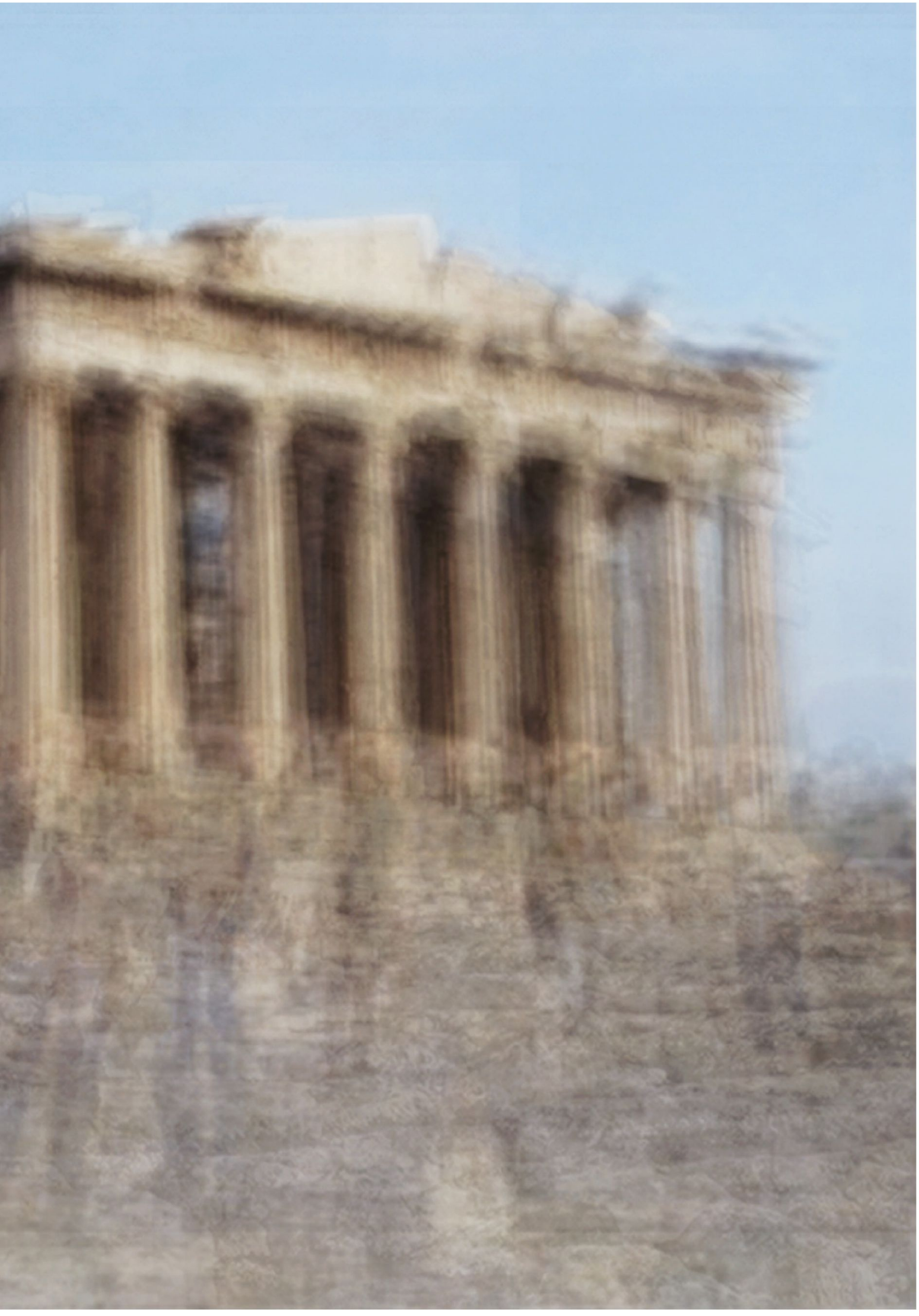



CMoi
DONNET ROUGE

Corinne Vionnet, Greece, 2006 *Swiss artist Vionnet searches photo-sharing sites and digitally stitches together hundreds of tourist snapshots. Most are taken from a similar vantage point, reflecting our collective desire to re-create idealized copies of iconic places like the Parthenon.*

FROM HER BOOK *PHOTO OPPORTUNITIES*





New York can be uploaded and within seconds get a response from someone in Lagos.

With so many photographs on the Web every day, no one image gets to be special for long. Decades after the Vietnam War, Nick Ut's photo of nine-year-old Kim Phuc, burning from napalm and running naked down a road, is still vivid in our imaginations. Eddie Adams's image of a South Vietnamese general executing a Vietcong infiltrator changed the way the public saw the war and arguably affected the course of history. But if there are fewer memorable images today,

There's something exciting about the society-wide experiment the digital age has thrust upon us.

it's not because there are fewer good images. It's because there are so many.

The ubiquity of cameras is transforming the way we experience dramatic events. Surveillance cameras are everywhere, providing police with clues to crimes like the Boston Marathon bombing. When there are demonstrations in Tahrir Square or a tornado tears through a town in Oklahoma, it is ordinary citizens with cell phones, not photojournalists, who often provide the first news images. Quality still matters, but it's less important than what's relevant and instantly shared.

As the masses embrace photography and news outlets enlist citizen journalists, professional standards appear to be shifting. Before digital images most people considered photographs to be accurate renderings of reality. Today images can be altered in ways undetectable to the naked eye. Photojournalists are trained to accurately represent what they witness. Yet any image can be doctored to create an "improved" picture of reality. The average viewer is left with no way to assess the veracity of an image except through trust in a news organization or photographer.

The slope gets slipperier still when even photojournalists start experimenting with camera apps like Hipstamatic or Instagram, which encourage the use of filters. Images can be saturated, brightened, faded, and scratched to create artful, hyper-real, and simulated-vintage photographs. Photographers using camera apps to cover wars and conflicts have created powerful images—but also controversy. Some worry that faux-vintage photographs romanticize war. With their nostalgic allusion to past wars, they risk distancing us from those who fight today's wars. Such images may be more useful in conveying how the person behind the camera felt than in documenting what was actually in front of the camera.

Yet photography has always been more subjective than we assume, each picture a result of a series of decisions—where to stand, what lens to use, what to leave in and what to leave out of the frame. Does manipulating photographs with camera app filters make them less true? Google Street View, whose cameras take images all over the world, is now used by art photographers who sit at their computers and curate eye-catching frames to claim as their own. With surveillance cameras blanketing urban centers, have we progressed to the point where cameras don't need photographers and photographers don't even need cameras?

There's something powerful and exciting about the society-wide experiment the digital age has thrust upon us. These new tools make it easier to tell our own stories—and they empower others to do the same. Many members of the media get stuck on the same narratives, focusing on elections, legislatures, wars, famines, and disasters, and in the process miss out on the less dramatic images of daily life that can be as revealing.

The democratization of photography might even be good for democracy itself. Hundreds of millions of potential citizen journalists make the world smaller and help hold leaders accountable. From Tehran to Taksim Square, people can now

PAGE 156, COUNTERCLOCKWISE FROM UPPER RIGHT: NICHOLE SOBECKI; HOLLY PICKETT, REDUX; LAURA EL-TANTAWY, VII PHOTO MENTOR PROGRAM; CHARLIE SHOEMAKER; SHANNON JENSEN; LAURA EL-TANTAWY, VII PHOTO MENTOR PROGRAM; HOLLY PICKETT, REDUX; GLENNA GORDON; CHARLIE SHOEMAKER; JANE HAHN; PETER DiCAMPO; CHARLIE SHOEMAKER. PAGE 157, COUNTERCLOCKWISE FROM UPPER RIGHT: GLENNA GORDON; CHARLIE SHOEMAKER (TWO); GLENNA GORDON; AUSTIN MERRILL; GLENNA GORDON



Michael Christopher Brown, China, 2010 *An early adopter of the camera phone as a photojournalism tool, Brown likes the way it allows him to blend in, especially in places where it's best to be inconspicuous. His iPhone work from Libya and other geopolitical hot spots has been published worldwide.*

show the world what they are up against, making it increasingly difficult for regimes to hide their actions. If everyone has a camera, Big Brother isn't the only one watching.

Who knows, this fanatical documentation and hyperconnection could lead to a profound shift in our way of being. Perhaps we are witnessing the development of a universal visual language, one that could change the way we relate to each other and the world. Of course, as with any language, there will be those who produce poetry and those who compile shopping lists.

It's not clear whether this flowering of image-making will lead to a more visually literate public—or simply numb us to the profound effects a well-made image can have. But the change is irreversible. Let's hope the millions of new photographs made today help us see what we all have in common, rather than what sets us apart. □

James Estrin is the co-editor of Lens, the New York Times *photography blog.*



Benjamin Lowy, Coney Island, New York, 2012
During Hurricane Sandy Time *turned over its Instagram feed to five photographers and asked them to document the disaster. Giving up control was novel but necessary: With electricity spotty, Instagram was the fastest way to deliver breaking news to readers.*

REPORTAGE BY GETTY IMAGES



Scott Strazzante, Chicago, Illinois, 2012
In addition to his Pulitzer Prize-winning work at the Chicago Tribune, *Strazzante posts work shot with a cell phone on the newspaper's blog called Shooting From the Hip.*





Balazs Gardi, Kabul, Afghanistan, 2011 *For a project called Basetrack, Gardi and three other photographers embedded with U.S. marines and shot images of war with an iPhone app. They shared the photos with the marines' friends, families, and the broader public via Facebook and other social media sites.*

Noah Fougere, Watertown, Massachusetts, 2013 *While police searched for the Boston bombing suspect, citizen journalists looked out their windows and kept the world informed. The ease of sharing news photos is changing what it means to be a photojournalist.*



Jon Rafman, Rv888, Finnmark, Norway, 2010 *The Canadian artist scours Street View images on Google Maps and picks out the bizarre and the beautiful, including this reindeer loping down a road (which was unharmed as the car drove by). The images now hang in galleries and raise the question: What is a photographer?*

GOOGLE MAPS/JON RAFMAN, ZACH FEUER GALLERY, NEW YORK/M+B GALLERY, LOS ANGELES



NG CONNECT

Every month this page features our staff picks of National Geographic Society products and events. For more go to *nglive.org.*

NATIONAL GEOGRAPHIC ON TV



Nat Geo Photographers

To get just the right shot of Nyiragongo volcano in the Democratic Republic of the Congo (left), Carsten Peter rappelled into its fiery interior. Tune in this month as the National Geographic Channel celebrates this magazine's legendary photographers and the risks they've been taking for over a hundred years to document the world and all that is in it.

TRIP



NEW SHIP *Orion* (left), the latest addition to the National Geographic fleet, is setting sail for the Pacific. Choose your voyage and book your cabin aboard the 102-passenger ship at *ngexpeditions.com/newship.*

WORKSHOP

PHOTO WORKSHOPS Hone your skills with *Geographic* contributor Jay Dickman during a week of assignments, talks, and editing sessions in Wyoming's cowboy country (right). Find workshops elsewhere in the U.S. and in Europe with other top photographers at *ngexpeditions.com/workshops.*



EXHIBIT



WOMEN OF VISION This exhibit premieres in Washington, D.C., in October and showcases the work of 11 female photographers, including Lynn Johnson, who shot this image of Christian worshippers in India (left). More information is at *ngmuseum.org.*

MAP

RAILROADS OF AMERICA See the lines that crisscrossed the country during railroad's 1920s heyday and the modern rails that operate at full steam today. Visit *natgeomaps.com*.

Book of the Month



Dawn to Dark Photographs

National Geographic's award-winning photographers see the world in many different lights, from a soft pink sunrise over the Andes to a moonlit waterway in Maine. Their best shots of morning, afternoon, and night are collected in this new volume, which reveals the multiple ways natural light plays across the globe throughout the day. Available now ($40).

PHOTOS (FROM TOP): CARSTEN PETER, NATIONAL GEOGRAPHIC CREATIVE; KEN DUNCAN, LINDBLAD EXPEDITIONS; JAY DICKMAN; LYNN JOHNSON

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Best of all, Perfect Choice HD™ is comfortable and discreet. The lightweight case (you can choose between Silver and Beige) nestles in behind your ear. The clear hearing tube (good luck spotting it in the picture to the right... look closely, it's there) is connected to a flexible tip that fits comfortably into your ear canal. No one needs to know you are using it, and no one needs to know it didn't cost you thousands of dollars. The unit comes pre-programmed and is ready to use right out of the box, so it's the hassle-free choice that you can begin enjoying immediately.

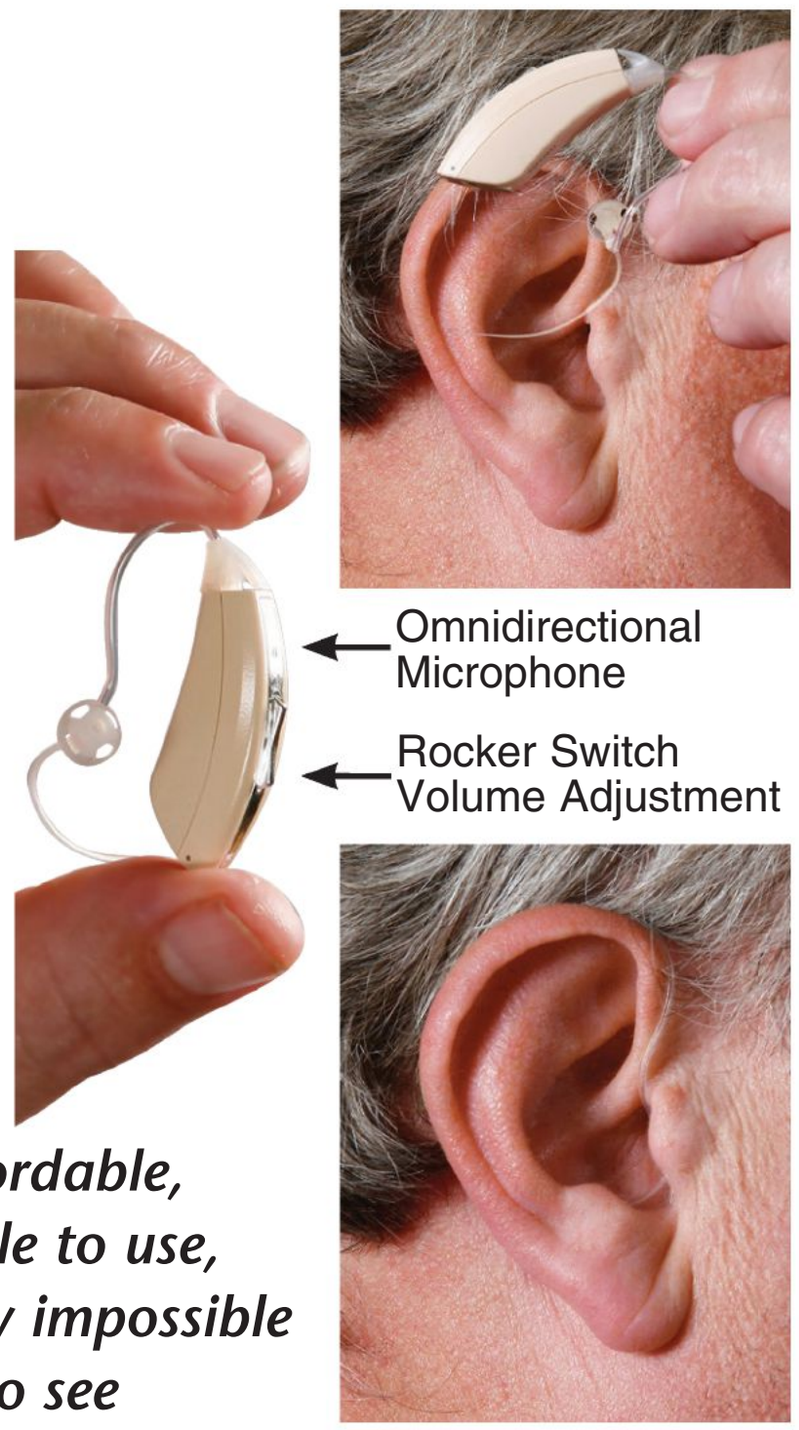
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Innocence Lost The child's name is Innocent. To photographer Bleasdale, she symbolizes the tragedy of the Democratic Republic of the Congo. An orphan, she died of diarrhea, a treatable condition. And it's not as if the DRC lacks resources. The country is rich in minerals, mined for use in electronic devices and fought over by armed groups. Miners often die on the job—that's how Innocent lost her father. Bleasdale's years of covering Congo have brought him to too many child funerals—and inspired him to raise money for the St. Kizito orphanage, where Innocent died. *—Daniel Stone*



BEHIND THE LENS

How dangerous is your work in the Congo?

MB: There are always challenges working in a situation like that. It wasn't Iraq or Afghanistan, but it was still a rebel war run by warlords. You get shot at by people who don't know who you are or why you're there. It can be challenging to get around and build trust. At one point, because we were outsiders, we were arrested by a group of rebels and were detained for a day.

Why do you keep going back?

Congo is a place you see on the news once every two years. And yet more people have died there than in any conflict since World War II—five and a half million. More than 90 percent of those deaths come from malnutrition and lack of access to health care. That's just insane. I get so angry that there's no action from governments around the world. I'm dumbfounded that the international community doesn't do more.

Do you have hope?

I do. In 1991, at the end of the Cold War, there were only three free democracies in Africa. Now there are 25, of varying shades. Congo's regime will become more of an exception than the norm.

If You Paid for Vioxx Before October 1, 2004

You Could Get Up to $50 or More from a Settlement

A Settlement has been reached with Merck Sharp & Dohme Corp. ("Merck") about the prescription anti-inflammatory drug, Vioxx. This proposed class action Settlement will pay consumers who paid out-of-pocket expenses for Vioxx (that were not reimbursed).

What is the Lawsuit About?

This lawsuit claims that Merck falsely advertised the drug Vioxx as having greater benefits than less expensive pain medicines, which contradicted the drug's Food and Drug Administration approved labeling. Merck denies any liability for the claims in the lawsuit and admits no wrongdoing by agreeing to this Settlement. The Court did not decide which side was right. Instead, the parties decided to settle. People who claim personal injury from Vioxx cannot make a claim for payment. This Settlement does not release their claims.

Who's Included?

Generally, you are included if you paid (or were required to pay) for all or part of the purchase price of Vioxx (for personal or family use) before October 1, 2004. If you settled a Vioxx personal injury claim you are not included in the Settlement. Similarly, if you were a Missouri resident when you purchased Vioxx, you are not included in the Settlement. The full Class definition is included in the long form Notice available at the Settlement Website.

What Can You Get?

Merck will pay up to $23 million to settle the lawsuit. All costs of the Claims Administrator to administer the Settlement, the cost to inform people about the Settlement, and the attorneys' fees and costs will be paid out of this Settlement Amount. Class Members who submit valid claims can get: (1) up to $50 in cash or (2) reimbursement for up to the actual out-of-pocket expenses paid for Vioxx and up to $75 for certain other costs and losses. Payments will vary depending upon several factors such as the number of claims submitted, the amounts claimed, the proof submitted, and other adjustments and deductions.

How to Make a Claim for Payment?

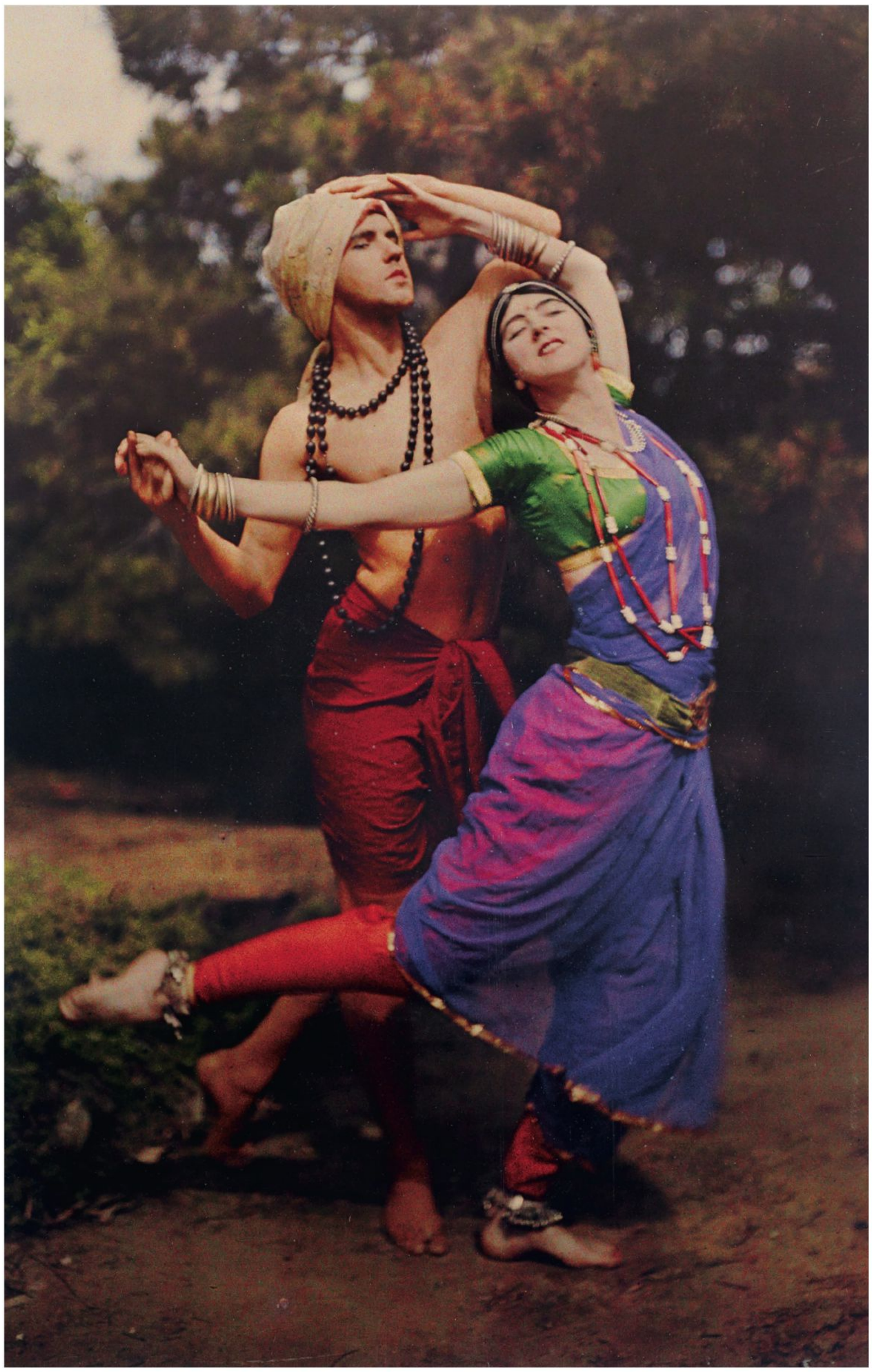
You must submit a Claim Form by **May 6, 2014** to get a payment from the Settlement. The Claim Form is available at www.VioxxSettlement.com or by calling 1-866-439-6932. The Claim Form can be submitted online or by mail.

Your Other Rights.

If you do nothing, your rights will be affected. If you do not want to be legally bound by the Settlement, you must exclude yourself from the Class by **November 9, 2013** or you will not be able to sue Merck for any claim relating to the lawsuit. If you stay in the Class, you may object to the Settlement by **November 9, 2013**, but will be bound by the terms of the Settlement if approved by the Court.

The Court will hold a hearing on **December 13, 2013** to consider whether to approve the Settlement and a request for attorneys' fees and expenses up to 32% of the maximum $23 million Settlement Amount or up to $7.36 million. You can appear at the hearing, but you don't have to. You can hire your own attorney, at your own expense, to appear or speak for you at the hearing.

For complete information and a Claim Form:
Visit: www.VioxxSettlement.com Call: 1-866-439-6932



Motion Pictured

Pioneers of modern dance Ruth St. Denis and Ted Shawn pose for photographer Franklin Price Knott in this Autochrome—an early color photo process—from the April 1916 *Geographic.* The dance pictured, the "Garden of Kama," was one of many India-influenced works by the pair, who married in 1914. Their Denishawn School of Dancing and Related Arts in Los Angeles, California, counted choreographer Martha Graham and silent film actress Louise Brooks as alumnae.

Knott must have liked the couple: Two images of them appear in his portfolio of Autochromes in that issue. His other colorful subjects include a cowboy, pumpkins, and tigers in a New York zoo.

Today National Geographic's archive maintains nearly 15,000 glass-plate Autochromes, one of the largest such collections in the world.

—Margaret G. Zackowitz

Get Lost in Found. Go to **NatGeoFound.tumblr.com.**

PHOTO: FRANKLIN PRICE KNOTT, NATIONAL GEOGRAPHIC CREATIVE

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Agile Gibbon *(Hylobates agilis)*
Size: Head and body length, 45 - 65 cm (17.7 - 25.6 inches) **Weight:** Males, 5 - 7.5 kg (11 - 16.5 lbs); females, 4.5 - 7.3 kg (9.9 - 16.1 lbs) **Habitat:** Semi-deciduous monsoon and tropical evergreen forest
Surviving number: Unknown; populations declining

Photographed by Thomas Marent

WILDLIFE AS CANON SEES IT

Sing together, swing together. Agile gibbon families begin the day with complex songs, including solos, male-female duets and a coda. These musical calls serve to advertise their territory and the strength of the pair bond. At foraging time, they use their long, powerful arms to swing rapidly from tree to tree in search of sweet fruits, immature leaves and insects. By dispersing seeds, agile gibbons contribute to the health of the ecosystem, but living entirely within closed-canopy forest makes them highly vulnerable to habitat loss and fragmentation. As trees fall, songs may be silenced forever.

As we see it, we can help make the world a better place. Raising awareness of endangered species is just one of the ways we at Canon are taking action—for the good of the planet we call home. Visit **canon.com/environment** to learn more.

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